

A REVIEW OF THE SUBFAMILY OXYINAE
(ORTHOPTERA : ACRIDOIDEA)



BY
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SYNOPSIS

The Old World Acridid subfamily Oxyinae is reviewed and redefined. A key is given to the 21 genera now included in the subfamily. Each genus is defined and a list is given of its included species. Of the 169 described species in the subfamily, 125 are regarded as valid. 125 primary types, including those of the genus *Oxya*, have been examined and as a result 11 new generic synonyms, two new specific synonyms and 25 new combinations are proposed. One new genus is described; one generic name, one specific name and three combinations are revived.

INTRODUCTION

DURING a recent study on the genus *Oxya* (Hollis, 1971) it became clear that (i) the genus *Oxya* did not represent a monophyletic entity, (ii) the derivations of the various species-groups involved in *Oxya* were obscure, and (iii) the current definition and scope of the subfamily Oxyinae (Dirsh, 1961) needed some form of revision and rearrangement. At that time it was thought practical to publish the results of the study on *Oxya* separately (Hollis, 1971) considering the genus as a convenient entity but pointing out that some of its species-groups should be transferred to other genera and that study was continuing on the whole subfamily. The results of this study are presented below in review form as it was found impractical, both in terms of time and available information, to make a complete systematic revision of the group.

This review is based on a study of the extensive collections of Oxyinae housed in the British Museum (Natural History), London; the Museum für Naturkunde der Humboldt-Universität, Berlin; the Instituto Español de Entomología, Madrid;

and the collection of the late C. Willemse. Type and other material was borrowed from institutions in Basle, Eberswalde, Geneva, Leiden, Oxford, Paris and Stockholm.

Drawings of the parts of the male phallic complex were made after extraction and maceration in 10 per cent. potassium hydroxide solution, and the abbreviations used in these figures are based on those used in Hollis (1971). Drawings of other features were made from dry material.

Type-depositories of species included in the subfamily are given in abbreviated form as follows.

NM, Basle	Naturhistorisches Museum, Basle.
MNHU, Berlin	Museum für Naturkunde der Humboldt-Universität, Berlin.
BMNH	British Museum (Natural History), London.
IRSNB, Brussels	Institut Royal des Sciences Naturelles de Belgique, Brussels.
UZM, Copenhagen	Universitetets Zoologiske Museum, Copenhagen.
DEI, Eberswalde	Deutsches Entomologisches Institute, Eberswalde, D.D.R.
MHN, Geneva	Muséum d'Histoire Naturelle, Geneva.
MCSN, Genoa	Museo Civico di Storia Naturale, Genoa.
RNH, Leiden	Rijksmuseum van Natuurlijke Historie, Leiden.
ZI, Leningrad	Zoological Institute, Academy of Sciences of U.S.S.R., Leningrad.
IEE, Madrid	Instituto Español de Entomología, Madrid.
UM, Oxford	University Museum, Oxford.
MNHN, Paris	Muséum National d'Histoire Naturelle, Paris.
ANS, Philadelphia	Academy of Natural Sciences, Philadelphia.
ZIHU, Sapporo	Zoological Institute, Hokkaido University, Sapporo.
NR, Stockholm	Naturhistoriska Rijksmuseum, Stockholm.
MRAC, Tervuren	Musée Royal de l'Afrique Centrale, Tervuren.
ZIUU, Uppsala	Zoologiska Institutionen, Uppsala.
NM, Vienna	Naturhistorisches Museum, Vienna.
USNM, Washington	U.S. National Museum, Washington.
coll. Willemse	Dr Fer Willemse, Eygelshoven, Laurastraat 67, Netherlands

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This is an opportune moment for me to thank Dr L. L. Mishchenko, of the Academy of Sciences, Leningrad, for his help in lending type-material of the genus *Oxya* and to apologize for not acknowledging his valuable help towards the production of my previous paper (Hollis, 1971).

HISTORICAL

Although first named by Brunner (1893 : 136) as the 'Oxyae', the group was recognised earlier by Stål (1878 : 45) as 'part 1 of Division 12' in his key to Orthopteran genera. I. Bolívar (1918) redefined the group as 'Section Oxyae' of the family Acrididae; Willemse (1921) listed the genera he considered to belong to the group Oxyae of the subfamily Cyrtacanthacrinae occurring in the austro-oriental region; Rehn (1957), in his study of the Australasian Acrididae, gave the

TABLE I

Genera included by various authors in the Oxyinae

Genus	Stål (1878)	Brunner (1893)	Bolívar (1918)	Willemse (1921)	Rehn (1957)	Dirsh (1961)
<i>Quilta</i>	✓	✓	✓	✓		✓
<i>Gesonia</i> (now <i>Gesonula</i>)	✓	✓	✓	✓	✓	
<i>Oxya</i>	✓	✓	✓	✓	✓	✓
<i>Caryanda</i>	✓	✓	✓	✓		✓
<i>Digentia</i>	✓	✓	✓			✓
<i>Bermius</i>	✓	✓	✓	✓	✓	
<i>Hieroglyphus</i>	✓	✓	✓	✓		
<i>Tauchira</i>	✓	✓	✓	✓		
<i>Racilia</i>	✓	✓	✓	✓		✓
<i>Badistica</i>		✓	✓			✓
<i>Hieroceryx</i> (now <i>Parahieroglyphus</i>)			✓	✓		
<i>Chitaura</i>			✓	✓		✓
<i>Fer</i>			✓	✓		
<i>Genditia</i>			✓			✓
<i>Carydana</i>			✓			
<i>Gerista</i>			✓			✓
<i>Tauchiridea</i>			✓	✓		
<i>Maga</i>			✓	✓		
<i>Cledra</i> (now <i>Cercina</i>)			✓			✓
<i>Gerunda</i>			✓	✓		
<i>Pododula</i>			✓			
<i>Theomolpus</i>			✓	✓	✓	
<i>Bermiella</i>			✓	as <i>Macroquilta</i>	✓	
<i>Bermioides</i>			✓	✓	✓	
<i>Racilidea</i>			✓	✓		
<i>Austeniella</i>						✓
<i>Caledonia</i> (now <i>Caledonula</i>)						✓
<i>Dapperia</i>					✓	✓
<i>Dibastica</i>			✓			✓
<i>Lucretilis</i>						✓
<i>Pterotiltus</i>						✓
<i>Zulua</i>	as <i>Oxya</i>					✓
<i>Brachycercus</i>				✓		
<i>Tolgadia</i>					✓	

group tribal status. Dirsh (1956 : 253) defined the group Oxyae of the subfamily Catantopinae using, in addition to external characters, some male phallic complex structures, and the same author (Dirsh, 1961 : 400) gave the group its current definition and status as a sub-family.

The earlier authors, viz. Stål, Brunner and Bolívar, all used a similar assemblage of characters to define the group, and these in essence were: fastigium of vertex horizontal or subhorizontal, little produced forward and forming a rounded angle with the frons; frontal ridge sulcate and continuous to clypeus; prosternal process conical or transverse but if latter then narrow at base; mesosternal lobes not contiguous; fore wing without transverse parallel stridulatory veinlets; lower genicular lobe of hind femur usually produced posteriorly into a spine, sometimes angular, rarely rounded; hind tibia with small spines, outer apical spine almost always present; male subgenital plate conical, produced, with rounded or subacute apex. Willemse and Rehn added nothing significant to this definition. Dirsh (1961) used basically this definition adding to it the form of the male epiphallus, i.e. bridge-shaped with divided or partially divided bridge, with ancorae and lophi; and the flexured form of the penis valves in the phallic complex. The genera included in these various authors' groups are given in Table 1. It is noticeable from this table that Dirsh included far fewer genera in the group than did Bolívar, principally due to the placing of *Bermius*, *Gesonula*, *Hieroglyphus*, *Parahieroglyphus* and *Tauchira* into his subfamily Hemiacridinae, and others presumably into the subfamily Catantopinae.

EVALUATION OF PRESENT CLASSIFICATION AND CHARACTERS USED

In his revision of the higher groups of Acridoidea Dirsh (1961 : 358) states that he regards a subfamily 'as a group of genera with one or more convenient characters or a combination of characters, which do not normally occur in other groups of genera of the family, but are not exclusive . . .', and on this basis divides the family Acrididae into 17 subfamilies including the Hemiacridinae, Oxyinae and Catantopinae. It is clear from his key (Dirsh, 1961 : 389) that the Hemiacridinae are separated from the Oxyinae on the basis of the former having transverse parallel stridulatory veinlets on the tegmen and divided penis valves, and the latter having no such stridulatory mechanism, flexured penis valves and the lower genicular lobe of the hind femur spine-like posteriorly. The Catantopinae are defined by a series of negatives as a dumping ground for all those genera which cannot be placed into any of the other 16 subfamilies.

In studying the Oxyinae it is obvious that the limits of the group become very vague and merge with some genera in the Hemiacridinae. This latter group is probably polyphyletic and badly needs reviewing. Dirsh's classification of the Acrididae on an arbitrary basis of convenient characters, although representing some progress and providing at least a library classification of the group, has no strong phylogenetic basis, and in terms of predictive value, is often misleading. Having an existing classification of the acridids one is either forced to fit genera into its framework or to make a complete revision of the whole family; one cannot,

piecemeal upgrade or downgrade individual groups within the classification. I regard the erection and definition of acridid subfamilies as highly ambitious given the present state of our knowledge of the group. All one can say about the Acrididae at present is that, apart from a few groups including Coptacridinae, Calliptaminae, Euryphyminae, the Cyrtacanthacridinae and the Acridinae-Truxalinae complex, it is a large assemblage of genera in which certain groupings are recognizable but the affinities of a large proportion of the genera are obscure.

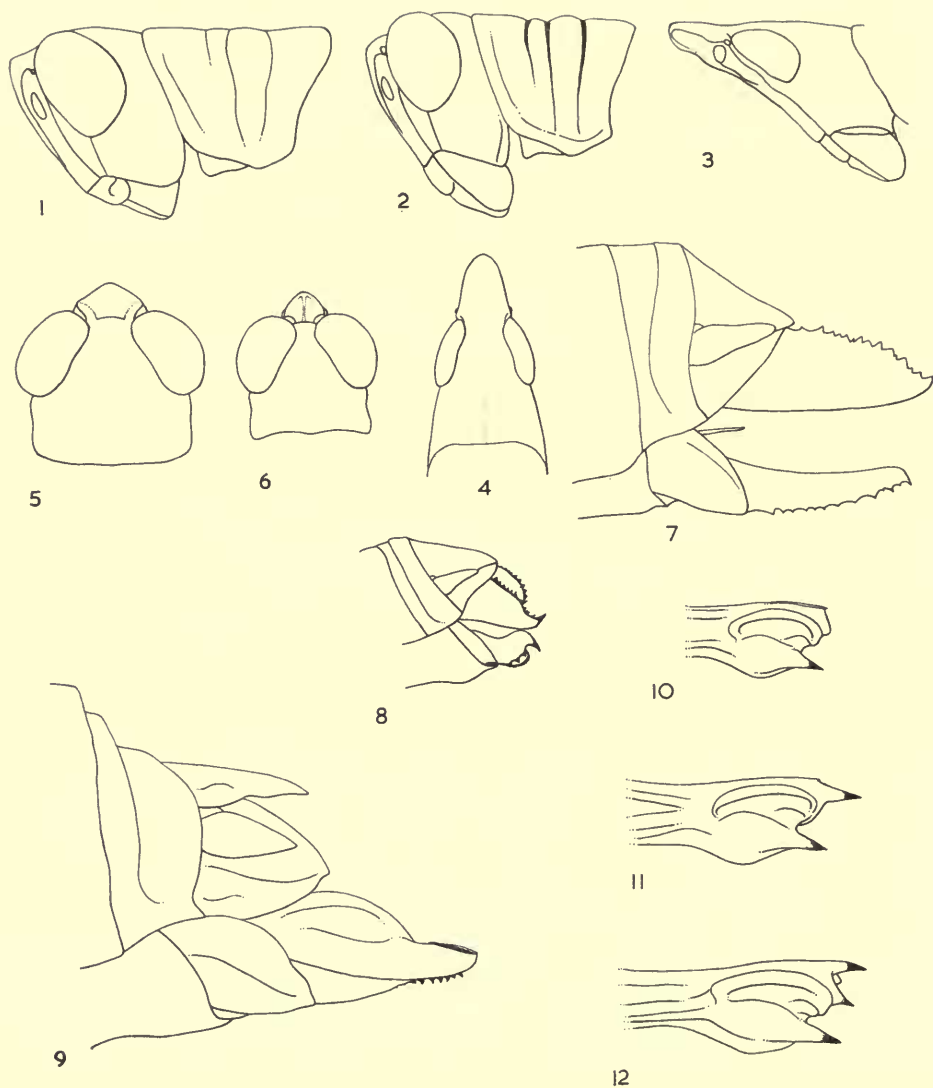
Ideally a classification should consist of monophyletic groupings which are based on uniquely derived characters. To judge whether or not any one character or group of characters be uniquely derived it is important to understand the development and function particularly in relation to behaviour of such characters.

In general apart from a few pest species, acridids are very poorly studied as live animals and any assessment of the characters used to define the Oxyinae both previously and in the present paper can only be surmise. Some observations on these characters are given below.

EPIPHALLUS (Text-figs 13, 14, 20-35, 38-69). Dirsh (1956:233) reasonably concludes that this structure is used to depress and grasp the female subgenital plate and fix the phallus firmly during copulation; the ancorae, when present, or the anterior edge of the epiphallus achieve the fixing by either pressing against the male supra-anal plate or the dorsal surface of the phallus. In the Oxyinae the epiphallus may or may not have ancorae, also it is normally bridge-shaped and almost always completely divided. This division is interesting as it is probably a secondary development and may allow the epiphallus to be used in more than one plane, perhaps facilitating a method of copulation different from the normal acridid method. In the genus *Stolzia* this division appears much more significant as the two halves of the epiphallus are not symmetrical (Text-figs 31-35). In the genus *Oxyina* the epiphallus is almost shield-like (Text-figs 45-47) and although the main structure is divided, the epiphallic membrane is sclerotized above the dorsal margin of the epiphallus, giving the structure rigidity in one plane, a return to the normal acridid condition but by a derived method. Although considered here as a feature of the Oxyinae, a divided epiphallus also occurs in some Hemiacridinae, Coptacridinae, Catantopinae, all the Euryphyminae and in some of the South American group of genera related to *Cornops* and *Tetrataenia*, the Leptismae.

FLEXURED OR DIVIDED PENIS VALVES (Text-figs 15-19). Dirsh (1961) states that the South American group Chilacridinae and the Hemiacridinae are the only subfamilies in the Acrididae in which the genera have divided penis valves. To these must be added the group Leptismae. In some other groups the flexure is very weak and difficult to see.

Dirsh (1962) also describes some Hemiacridinae genera from Madagascar with flexured penis valves. Clearly this character is of doubtful diagnostic value. Presumably the penis valves are used to compress the spermatophore sac and



FIGS 1-12. Oxyinae genera, morphological aspects. *Cercina obtusa* Stål, 1, head and pronotum, lateral view; *Cylindrotiltus versicolor* Ramme, 2, head and pronotum, lateral view; *Quiltaoryzae* Uvarov, 3, head, lateral view; 4, same, dorsal view; 11, apex of hind femur, lateral view; *Ochlandriphaga xanthelytrana* Miller, 5, head, dorsal view; *Chitaura brachyptera* I. Bolívar, 6, head, dorsal view; *Oxya agavisa* Tsai, 7, female ovipositor, lateral view; *Gesonula mundata* (Walker), 8, female ovipositor, lateral view; *Thanmoia gustavi* Ramme, 9, female ovipositor, lateral view; *Oxya chinensis* (Thunberg), 10, apex of hind femur, lateral view; *Hygracris palustris* Uvarov, 12, apex of hind femur, lateral view.

apically as an intromittant organ. The significance of divided or flexured valves is unknown. In all Oxyinae genera the valves are flexured.

GENICULAR SPINE ON HIND FEMUR (Text-figs 10–12). The function of this structure is obscure although it forms an interesting continuation of the spines on the hind tibia and possibly has a defensive function. A similar structure is common in the Eumastacids and is present in some Hemiacridinae and the South American group of genera, the Leptismae. The significance of a spined lower genicular lobe is not understood but it is notable that, in the genera *Quilta* and *Hygracris*, where the upper genicular lobe is extended this is also terminated in a spine. In other acridid groups where this genicular extension occurs, e.g. *Acanthoxia*, *Cannula*, *Amphicremna*, the lobes are rounded or angular and not at all spine-like.

OUTER APICAL SPINE OF HIND TIBIA. This structure seems to be just a continuation of the normal tibial spines. It is hardly ever present in the supposedly more highly evolved Acridids and in the Oxyinae its presence is variable. In some genera, e.g. *Oxya*, it is always present and obvious, in some it is weak, in some, e.g. *Gerista*, it is absent, but in some, e.g. *Thanmoia*, it may be present or absent, even to the extent that a specimen may have the spine on one side and absent on the other. Possibly this structure is a primitive feature which, at the Oxyinae stage of development of the Acrididae, is in the process of being lost.

EXPANSION AND FLATTENING OF HIND TIBIA. This is a feature obviously developed as an adaptation to life in marshy habitats. It has arisen several times in unrelated genera, e.g. *Oxya*, *Paulinia*, *Jasomenia* and *Paracinema*, and cannot be regarded as a uniquely derived character. However, it does seem to be a feature more or less developed in almost all Oxyinae genera, with the exception of *Pterotiltus* where, in all probability, it is secondarily lost.

VENTRAL ABDOMINAL HAIR TUFTS. Again this feature seems to be associated with life in wet habitats and probably provides buoyancy by trapping air when the grasshopper jumps into water.

OVIPOSITOR VALVES (Text-figs 7–9, 36, 37). Obviously the type of substrate in which the animal deposits its eggs has had a direct effect, through selection, on the form of the ovipositor valves. In the Oxyinae the ovipositor valves are usually slender, somewhat fragile structures with or without teeth or spines. In *Gesonula*, *Thanmoia* and *Stolzia* they have quite complicated forms and obviously oviposition sites in these genera are restricted and specialized. It has been found convenient to exclude genera from the Oxyinae which have the short, curved, unspined, robust ovipositor valves found in most Acrididae.

PROSTERNAL PROCESS. Uvarov (1966:164) in summary suggests that this structure is an important taxonomic character, has tactile functions and is parti-

cularly important to climbing species. In the Oxyinae it is either a simple conical structure or is transverse with a narrow base and a widened, often trilobate apex. Both shapes are common in the Acrididae.

TRANSVERSE PARALLEL STRIDULATORY VEINLETS ON TEGMEN. Dirsh (1956 : 255) used this character to define the subfamily Hemiacridinae on external features. After examining a number of genera in which this structure occurs I suspect that it is a stridulatory mechanism which has evolved more than once in related groups and although generally useful in suggesting affinities with the Hemiacridinae it should not be used exclusively for that group. This character does occur in a few genera of Oxyinae, e.g. *Tauchira*, *Gesonula*, *Fer*.

In conclusion it is clear that the characters used to define the subfamily Oxyinae cannot be definitely regarded as uniquely derived, their state of apomorphy or plesiomorphy is still not clear, and no one character is exclusive to the subfamily. As the present paper bases the group on slight modifications of these characters it can be argued that little or no progress has been made and my criticisms above of the previous classifications are invalid. However, some attempt has been made to rationalize the characters used and in the taxonomic section below many genera previously grouped in the Catantopinae are now included in the Oxyinae, and some genera previously considered as Oxyinae are removed to other subfamilies. If similar studies of the Hemiacridinae, Tropicopolinae and Catantopinae other than the *Catantops* group were made a much clearer idea of the value of characters used to separate the subfamilies would emerge.

Subfamily OXYINAE

Oxyae Brunner von Wattenwyl, 1893 : 136. Type-genus: *Oxya* Audinet-Serville.
Oxyinae Brunner von Wattenwyl; Dirsh, 1961 : 400.

DIAGNOSIS. Head normally subconical in profile, rarely elongate conical; fastigium of vertex normally short, rounded triangular or pentagonal from above, rarely elongate and then only when head elongate (Text-figs 1-6); frontal ridge sulcate, usually complete to clypeus; facial carinae usually present and complete, only incomplete or absent when frontal ridge is incomplete.

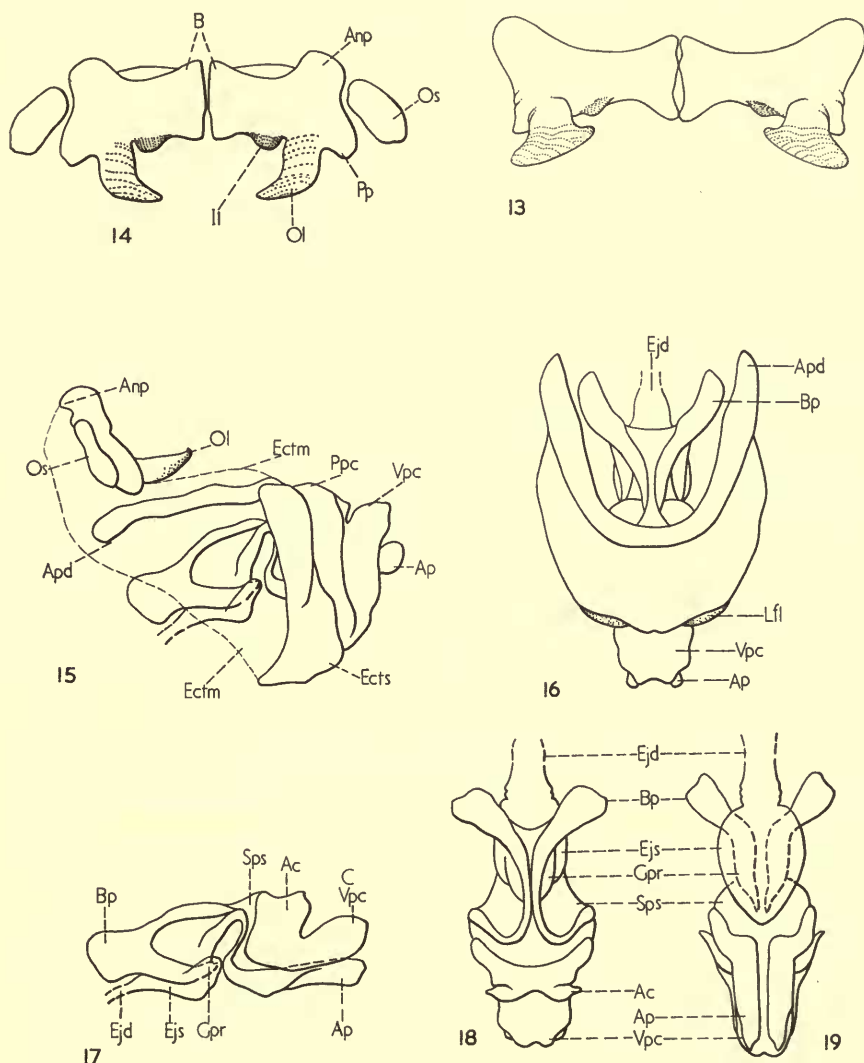
Dorsum of pronotum cylindrical or weakly flattened; median carinae linear, very weak and often incomplete, lateral carinae absent; prosternal process conical or transverse and if latter then always with narrow base; mesosternal interspace open and usually longer than wide. Tegmina and hind wings fully developed, reduced or rarely absent, tegmen sometimes with a row of transverse parallel stridulatory veinlets in the radial area. Tympanum always present. Lower genicular lobe of hind femur produced posteriorly into a spine. Hind tibia usually expanded in apical half or third, with acute upper margins; external apical spine of hind tibia present or absent.

Distal sternites of abdomen with tufts of short hairs.

Male epiphallus almost always with completely divided bridge, rarely incompletely divided, bridge usually narrow, ancorae present or absent, at least one pair of lophi present. Cingular

valves fused apically usually forming a curved plate which partially or completely covers apical penis valves (Text-figs 16–19); cingulum usually produced slightly postero-dorsally over valvular plate of cingulum; basal and apical penis valves flexured.

Female ovipositor valves almost always slender and fairly long, often with serrate margins and if curved then only apically so (Text-figs 7–9, 36, 37).



FIGS 13–19. *Oxya* species, male genitalia. *O. glabra* (Ramme), 13, epiphallus; *O. hyla* Audinet-Serville, 14, epiphallus; 15, phallic complex, entire, lateral view; 16, same, dorsal view, epiphallus and epiphallic membrane removed; 17, endophallus, lateral view; 18, same, dorsal view; 19, same, ventral view.

DISCUSSION. The subfamily is Old World in distribution and includes the following genera: *Oxya*, *Caryanda*, *Thanmoia*, *Bumacris*, *Stolzia*, *Badistica*, *Gerista*, *Pterotiltus*, *Digentia*, *Cylindrotiltus*, *Cercina*, *Fer*, *Gesonula*, *Quilta*, *Hygracris*, *Oxyina*, *Lucretilis*, *Oxytauchira*, *Tauchira*, *Chitaura* and *Ochlandriphaga*.

The genera *Gerunda* and *Racilidea* do not have spined genicular lobes of the hind femora or expanded hind tibiae and are not considered as Oxyinae. They are probably related to *Binulacris*, *Paramaga* and *Pseudogerunda*, but this whole group needs to be revised as there is probably some synonymy both at generic and specific levels.

The Australasian genera, viz. *Berminus*, *Bermiella*, *Bermioides*, *Caledonuln*, *Dapperia*, *Kosciuscula*, *Laxabilla*, *Methiola*, *Methiolopsis*, *Praxibulus*, *Tauchiridea* and *Tolgaadia*, represent an interesting complex intermediate between the Hemiacridinae and the Oxyinae. As none of these genera completely fit the definition of the subfamily given above they are not considered here. I am avoiding the issue of their exact position within the Acrididae as very little material was available for study (although Dr Key of C.S.I.R.O., Canberra was kind enough to send me examples of the type-species of some of the genera concerned) and further the Australasian fauna in this group is so poorly recorded there may be presently undescribed but known material to consider. On balance I suspect these genera are more closely related to *Hieroglyphus* and *Spathosternum*. Under the present classification, therefore, they would be placed in the Hemiacridinae.

The South American group Leptismae present another interesting facet as, externally, they appear to be very closely related to the Oxyinae. Most have well developed spines on the lower genicular lobes of the hind femur and expanded hind tibiae. However, the male cercus is a peculiar shape, very reminiscent of the African subfamily Eurphyminae, and the penis valves are clearly divided. The superficial resemblance between the groups is considered here as the result of convergent evolution in unrelated groups.

KEY TO THE GENERA OF OXYINAE

- | | | |
|---|---|--------------------------------|
| 1 | Prosternal process with apex broadened and transverse, often trilobate | 2 |
| — | Prosternal process simple, conical with subacute or rounded apex, rarely with bulbous apex | 6 |
| 2 | Fully winged or brachypterous species, folded tegmina always touching in mid dorsal line. | 3 |
| — | Micropterous species | 5 |
| 3 | Integument rugulose; hind femora, particularly along carinae, with many tubercles; frontal ridge evanescent well before clypeus. | LUCRETILIS (p. 206) |
| — | Integument without tubercles; frontal ridge extending down to clypeus. | 4 |
| 4 | Tegmen without trace of transverse parallel stridulatory veinlets; external apical spine of hind tibia present. | OXYTAUCHIRA (p. 204) |
| — | Tegmen with transverse parallel stridulatory veinlets in radial area; external apical spine of hind tibia usually absent. | TAUCHIRA (p. 201) |
| 5 | Fastigium of vertex, from above, rounded triangular, as long as or almost as long as wide (Text-fig. 6); pronotum smooth. | CHITaura (p. 204) |
| — | Fastigium of vertex, from above, rounded pentagonal, much wider than long, without median longitudinal carina (Text-fig. 5); pronotum rugulose. | OCHLANDRIPHAGA (p. 207) |

- 6 Radial area of tegmen with transverse parallel stridulatory veinlets. 7
 - Tegmen without trace of transverse parallel stridulatory veinlets. 8
 7 Fastigium of vertex with median longitudinal carinula; male cercus simple, conical;
 female ovipositor valves long, slender. **FER** (p. 208)
 - Fastigium of vertex without median longitudinal carinula; male cercus curved
 apically; female ovipositor valves short, stubby (Text-fig. 8) . . . **GESONULA** (p. 209)
 8 Both upper and lower genicular lobes of hind femur spined (Text-figs 11, 12) . . . 9
 - Only lower genicular lobes of hind femur spined (Text-fig. 10) 10
 9 Slender species; head elongate conical, fastigium of vertex almost as long as
 longest diameter of eye (Text-figs 3, 4) **QUILTA** (p. 210)
 - Robust species; head subconical, fastigium of vertex wider than long
 **HYGRACRIS** (p. 210)
 10 Male epiphallus with ancorae (Text-fig. 20) 11
 - Male epiphallus without ancorae (Text-fig. 13). 16
 11 Epiphallus strongly asymmetrical (Text-fig. 31) **STOLZIA** (p. 211)
 - Epiphallus symmetrical (Text-fig. 20) 12
 12 Epiphallus plate-like (Text-figs 45-47). **OXYINA** (p. 228)
 - Epiphallus normal, bridge-shaped (Text-fig. 20). 13
 13 External apical spine of hind tibia present. 14
 - External apical spine of hind tibia absent 15
 14 Epiphallus with one pair of outer lophi and two pairs of inner lophi (Text-fig. 40);
 fastigium of vertex with median longitudinal carinula, although sometimes weak
 and difficult to see. **CARYANDA** (p. 217)
 - Epiphallus with one pair of outer lophi and none or only one pair of inner lophi
 (Text-figs 48-53); fastigium of vertex without median longitudinal carinula.
 **BADISTICA** (p. 220)
 15 African species; epiphallus without inner lophi. **GERISTA** (p. 219)
 - Oriental species; epiphallus with an inner pair of lophi . . . **THANMOIA** (p. 207)
 16 Fully winged or brachypterous species 17
 - Micropterous species. 18
 17 Inner lophi of epiphallus absent, outer pair long and hook-like (Text-fig. 57).
 **BUMACRIS** (p. 222)
 - Epiphallus with pair of inner lophi, outer pair short, boot-shaped (Text-fig. 14).
 **OXYA** (p. 220)
 18 Hind tibia rounded and not expanded apically. **PTEROTILTUS** (p. 226)
 - Hind tibia expanded in apical half or third, with upper outer margins acute. . . 19
 19 Face and whole pronotum rugulose; antenna with median flagellar segments at
 least three times as long as broad; epiphallus incompletely divided (Text-figs
 61, 62) **DIGENTIA** (p. 223)
 - Face, pronotum and mesonotum smooth; antenna with median flagellar segments at
 most twice as long as broad; epiphallus completely divided (Text-fig. 60). . . 20
 20 African species; dorsum of pronotum cylindrical and deeply crossed by transverse
 sulci (Text-fig. 2) **CYLINDROTILTUS** (p. 225)
 - Ceylonese species; dorsum of pronotum flattened and only shallowly crossed by
 transverse sulci (Text-fig. 1) **CERCINA** (p. 224)

GENERIC DEFINITIONS AND LISTS OF INCLUDED SPECIES

Tauchira Stål, 1878

(Text-figs 24, 25)

Tauchira Stål, 1878 : 48. Type-species: *Oxya polychroa* Stål, designated by Kirby, 1910 : 397.
Bua I. Bolívar, 1918 : 31. Type-species: *Tauchira buae* I. Bolívar, by monotypy. [Synony-
 mised by Willense, 1930 : 131].

Paratraulia Willemse, 1925a : 355. Type-species: *Traulia obliquiannulata* Brunner von Wattenwyl, by original designation. [Synonymised by Ramme, 1941 : 114.]

Servillenia Ramme, 1941 : 121. Type-species: *Acridium abbreviatum* Audinet-Serville, by monotypy. **Syn. n.**

DIAGNOSIS. Head conical; fastigium of vertex parabolic, wider than long, median longitudinal carinula weakly present; frontal ridge sulcate, complete to clypeus, lateral facial keels complete. Eyes normal or slightly bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process transverse, antero-posteriorly flattened, apex trilobate. Dorsum of pronotum rugulose or subrugulose, slightly flattened, median carina weak, lateral carinae absent, crossed by three transverse sulci; relative width of mesosternal interspace variable. Tegmina and hind wings fully developed or shortened to brachypterous condition; parallel transverse stridulatory veinlets present, sometimes weakly, in 1st radial or medial area. Lower genicular lobe of hind femur spined; hind tibia very weakly expanded apically, with acute upper margins; external apical spine of hind tibia absent. In male 10th abdominal tergite with a weak furcula on postero-dorsal margin; epiphallus with narrow, divided bridge and well developed ancorae. Female ovipositor valves long, evenly toothed.

DISTRIBUTION. China, W. Malaysia, W. Indonesia.

SPECIES INCLUDED

Tauchira abbreviata (Audinet-Serville) **comb. n.**

Acridium abbreviatum Audinet-Serville, 1839 : 678. Holotype ♂, JAVA (lost). Neotype ♂, JAVA (MNHM, Berlin), designated by Ramme (1941 : 123) [examined].

T. polychroa (Stål)

Oxya polychroa Stål, 1875 : 32. Holotype ♀, MALAYA (Malacca) (NR, Stockholm).

Paratraulia bifasciata Willemse, 1925a : 357, fig. Holotype ♂, MALAYA (BMNH) [examined]. [Synonymized by Willemse, 1930 : 190 (footnote).]

T. buae I. Bolívar

Tauchira buae I. Bolívar, 1898 : 92. Syntypes ♂ and ♀, SUMATRA (MCSN, Genoa; IEE, Madrid) [♂ examined].

T. obliquiannulata (Brunner von Wattenwyl)

Traulia obliquiannulata Brunner von Wattenwyl, 1898 : 249. Holotype ♀, SUMATRA (? depository).

T. rufotibialis (Willemse)

Paratraulia rufotibialis Willemse, 1925a : 358. Holotype ♀, SINGAPORE (BMNH) [examined].

Paratraulia elegantula Willemse, 1930 : 190, fig. 98. Syntypes ♂ and ♀, SUMATRA (RNH, Leiden). [Synonymised by Willemse, 1956 : 202].

T. karnyi (Willemse)

Paratraulia karnyi Willemse, 1925a : 359. Holotype ♂, MALAYA (BMNH) [examined].

T. grandiceps (Willemse)

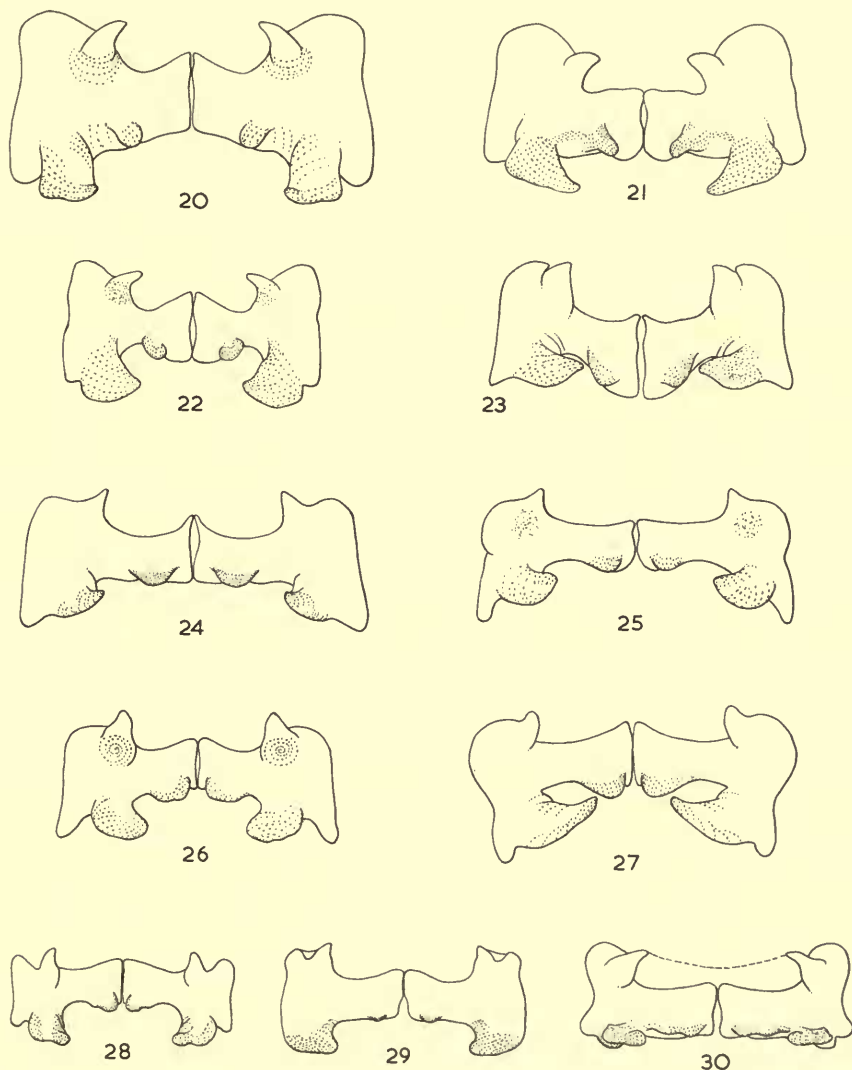
Paratraulia grandiceps Willemse, 1928 : 9. Holotype ♀, SUMATRA (RNH, Leiden).

T. gressitti Tinkham

Tauchira gressitti Tinkham, 1940 : 304, pl. 10, fig. 4, pl. 13, figs 2, 2a. Holotype ♂, CHINA (Hainan) (? depository).

DISCUSSION. The neotype male of *T. abbreviata* differs from other species of *Traulia* in that the dorsum of the pronotum is slightly less rugulose and flattened

and the parallel stridulatory veinlets of the tegmen are weaker but the latter is probably due to the shortening of the tegmen. These slight differences are not considered significant enough to warrant separate generic status for the species and *Servillenia* is synonymised with *Tauchira*.



FIGS 20-30. Oxyinae genera, male epiphalli. 20, *Thanmoia olivacea* (Willemse); 21, *T. maculata* (Willemse); 22, *T. gustavi* Ramme; 23, *Fer coeruleipennis* Willemse; 24, *Tauchira polychroa* (Stål); 25, *T. abbreviatum* (Audinet-Serville); 26, *Chिताura mirabilis* (Carl); 27, *C. lucida* (Krauss); 28, *C. indica* Uvarov; 29, *C. maculata* (Willemse); 30, *Oxytauchira aurora* (Brunner von Wattenwyl).

Oxytauchira Ramme, 1941

(Text-fig. 30)

Oxytauchira Ramme, 1941 : 117. Type-species: *Tauchira gracilis* Willemse, by monotypy.

DIAGNOSIS. Head conical; fastigium of vertex, from above, parabolic, about as wide as long, median longitudinal carinula weakly present; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes normal. Antenna about as long as combined lengths of head and pronotum. Prosternal process transverse, antero-posteriorly flattened, trilobate apically. Dorsum of pronotum weakly flattened, median carina weak, lateral carinae absent, shallowly crossed by three transverse sulci; mesosternal interspace longer than wide. Tegmen and hind wing fully developed, no trace of transverse parallel stridulatory veinlets on tegmen. Lower genicular lobe of hind femur spined; hind tibia hardly expanded apically but with acute upper margins, external apical spine of hind tibia present. In male 10th abdominal tergite with a furcula on postero-dorsal margin; epiphallus with narrow divided bridge and developed ancorae. Female ovipositor valves long, slender, unevenly spined.

DISTRIBUTION. Burma, Sulawesi.

SPECIES INCLUDED

Oxytauchira gracilia (Willemse)

Tauchira gracilis Willemse, 1931a : 242, fig. 99. Syntypes 2 ♀, SULAWESI (Central) (NM, Basle) [1 ♀ examined].

O. aurora (Brunner von Wattenwyl) **comb. n.**

Racilia aurora Brunner von Wattenwyl, 1893 : 155, pl. 5, fig. 53. Holotype ♂, BURMA (MCSN, Genoa).

DISCUSSION. The type of *O. aurora* was unavailable for study and the combination suggested here is based on a study of material in the BMNH collections thought to be this species. *O. aurora* is clearly not congeneric with other species of *Racilia* and the genus is returned to the Catantopinae and is thought to be related to *Gerunda*.

Chitaura I. Bolívar, 1918

(Text-figs 6, 26-29)

Chitaura I. Bolívar, 1918 : 32. Type-species: *Chitaura brachyptera* I. Bolívar, designated by Willemse, 1931a : 244.

Tauracris Willemse, 1931a : 248. Type-species: *Tauracris flavolineata* Willemse, by monotypy. [Synonymised by Ramme, 1941 : 135.]

Baliacris Willemse, 1938 : 116. Type-species: *Baliacris maculata* Willemse, by monotypy. **Syn. n.**

Chitaurella Ramme, 1941 : 136. Type-species: *Tauchira lucida* Krauss, by original designation. **Syn. n.**

DIAGNOSIS. Head conical; fastigium of vertex, from above, wider than long, pentagonal or rounded triangular, median longitudinal carinula weakly present; frontal ridge sulcate,

complete to clypeus; lateral facial keels complete. Eyes normal; antenna about as long as or slightly longer than combined lengths of head and pronotum. Prosternal process antero-posteriorly flattened, trilobate apically. Dorsum of pronotum subcylindrical, median carina weak, lateral carinae absent, shallowly crossed by three transverse sulci; mesosternal interspace as long as or slightly longer than wide. Tegmina and hind wings reduced to micropterous condition, scale-like, tegmen extending to posterior margin of first abdominal sclerite. Lower genicular lobe of hind femur spined; hind tibia slightly expanded apically with acute upper margins; external apical spine of hind tibia small but usually present. In male 10th abdominal tergite with furcula on hind margin; epiphallus with divided bridge and clearly defined ancorae. Female ovipositor valves long, slender, serrated.

DISTRIBUTION. S. India, W. Indonesia, Sulawesi, Maluku.

SPECIES INCLUDED

Chitaura lucida (Krauss) **comb. rev.**

Tauchira lucida Krauss, 1903 : 760, pl. 67, fig. 7. Syntypes ♂ and ♀, JAVA (? Jena Museum).

C. mirabilis (Carl)

Tauchira mirabilis Carl, 1916 : 472. Syntypes ♂ and ♀, SULAWESI (Central) (MHN, Geneva) [examined].

C. samanga (Carl)

Tauchira samanga Carl, 1916 : 474. Holotype ♂, SULAWESI (Central) (MHN, Geneva) [examined].

C. vidua (Carl)

Tauchira vidua Carl, 1916 : 475. Holotype ♀, SULAWESI (Central) (MHN, Geneva) [examined].

C. brachyptera I. Bolívar

Chitaura brachyptera I. Bolívar, 1918 : 33. Holotype ♀, SULAWESI (North) (IEE, Madrid) [examined].

C. indica Uvarov

Chitaura (?) *indica* Uvarov, 1929 : 553. Holotype ♂, INDIA (South) (BMNH) [examined].

C. flavolineata (Willemse) **comb. n.**

Tauracris flavolineata Willemse, 1931a : 248, figs 102, 103. Holotype ♀, SULAWESI (North) (NM, Basle) [examined].

C. maculata (Willemse) **comb. n.**

Baliacris maculata Willemse, 1938 : 117. Holotype ♂, BALI I. (coll. Willemse) [examined].

C. striata Willemse

Chitaura striata Willemse, 1938 : 117. Holotype ♀, KEY Is. (RNH, Leiden).

C. elegans Ramme

Chitaura elegans Ramme, 1941 : 128. Holotype ♂, SULAWESI (South) (MNHU, Berlin) [examined].

C. atrata Ramme

Chitaura atrata Ramme, 1941 : 129. Holotype ♂, SULAWESI (Central) (MNHU, Berlin) [examined].

C. mengkoka Ramme

Chitaura mengkoka Ramme, 1941 : 131. Holotype ♂, SULAWESI (South) (MNHU, Berlin) [examined].

C. ochracea Ramme

Chitaura ochracea Ramme, 1941 : 132. Holotype ♂, SULAWESI (South) (MNHU, Berlin) [examined].

***C. moluccensis* Ramme**

Chitaura moluccensis Ramme, 1941 : 133. Holotype ♂, MALUKU (Amboina) (NM, Vienna).

***C. poecila* Ramme**

Chitaura poecila Ramme, 1941 : 131. Holotype ♂, SULAWESI (North) (MNHU, Berlin) [examined].

***C. bivittata* Ramme**

Chitaura bivittata Ramme, 1941 : 133. Holotype ♀, MALUKU (Ceram) (MNHU, Berlin) [examined].

DISCUSSION. Ramme (1941 : 135) first suggested *Tauracris* may be synonymous with *Chitaura* and after examining Willemse's type of *T. flavolineata*, a female dried from spirit, this synonymy is confirmed.

The type male of *Baliacris maculata* lacks the external apical spine on both hind tibiae but this character appears to be very unstable in *Chitaura*, often being present on one hind leg and absent on the other. In general appearance this species is very similar to *C. lucida* and, on the evidence from external morphology and the structure of the male phallic complex, is placed in *Chitaura*.

C. lucida differs slightly from the bulk of the other species of *Chitaura* in that the dorsum of the pronotum is less rounded and the transverse sulci are slightly deeper, but these features do not warrant separate generic status and it is recombined with *Chitaura*.

***Lucretilis* Stål, 1878**

(Text-fig. 55)

Lucretilis Stål, 1878 : 41, 85. Type-species: *Lucretilis taeniata* Stål, by monotypy.

DIAGNOSIS. Head conical; fastigium forming a stepped join with vertex, pentagonal from above, wider than long, median longitudinal carinula very weak or absent; frontal ridge sulcate but present only down to median ocellus; lateral facial keels absent or if present then disguised by rugulosity of facial integument. Eyes bulbous. Antenna very much longer than combined lengths of head and pronotum. Prosternal process transverse in apical half, trapezoid in anterior view. Dorsum of pronotum rugulose and coarsely pitted, rounded, shallowly crossed by three transverse sulci, median carina very weak, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings somewhat reduced, extending to about half length of abdomen, former without trace of transverse parallel stridulatory veinlets. Hind femur tuberculate, lower genicular lobe spined; hind tibia very weakly expanded in apical half, upper margins acute apically; external apical spine of hind tibia present. In male 10th abdominal tergite with or without furcula on postero-dorsal margin; epiphallus with narrow divided bridge, ancorae and only an outer pair of lophi. Female ovipositor valves long, slender, completely smooth.

DISTRIBUTION. Malaysia, W. Indonesia.

SPECIES INCLUDED***Lucretilis taeniata* Stål**

Lucretilis taeniata Stål, 1878 : 85. Holotype ♂, SUMATRA (NM, Vienna).

***L. antennata* I. Bolívar**

Lucretilis antennata I. Bolívar, 1898 : 88. Holotype ♂, SUMATRA (IEE, Madrid) [examined].

***L. bolivari* Miller**

Lucretilis bolivari Miller, 1934 : 531, fig. 1, pl. 13, fig. 3. Holotype ♀, MALAYA (BMNH) [examined].

***L. uvarovi* Miller**

Lucretilis uvarovi Miller, 1935 : 695, fig. 5, pl. 14, fig. 5. Holotype ♂, MALAYA (BMNH) [examined].

***L. maculata* Willemse**

Lucretilis maculata Willemse, 1936 : 202. Holotype ♂, BORNEO (Central) (RNH, Leiden).

***L. splendens* Willemse**

Lucretilis splendens Willemse, 1938 : 118, fig. 1. Holotype ♂, BORNEO (North) (UM, Oxford) [topotypic material examined].

***L. dohrni* Ramme**

Lucretilis dohrni Ramme, 1941 : 98, pl. 13, fig. 8. Holotype ♀, SUMATRA (MNHU, Berlin) [examined].

***L. jucunda* Miller**

Lucretilis jucunda Miller, 1953 : 142, fig. 1. Holotype ♂, MALAYA (BMNH) [examined].

***Ochlandriphaga* Henry, 1933**

(Text-figs 5, 58)

Ochlandriphaga Henry, 1933 : 187. Type-species: *Ochlandriphaga xanthelytrana* Henry, by monotypy.

DIAGNOSIS. Head conical; fastigium of vertex forming stepped join with vertex, from above pentangular, without median longitudinal carinula; frontal ridge weakly sulcate, complete to clypeus; lateral facial keels weak and incomplete. Eyes bulbous. Antenna much longer than combined lengths of head and pronotum. Prosternal process antero-posteriorly flattened, with weakly trilobate apex. Dorsum of pronotum rounded, coarsely pitted, moderately deeply crossed by three transverse sulci, median carina very weak, lateral carinae absent; mesosternal interspace slightly longer than wide. Tegmina and hind wings reduced, scale-like, former not extending beyond middle of 3rd abdominal tergite. Lower genicular lobe of hind femur spined; hind tibia hardly expanded apically but dorsal margins acute in apical third; external apical spine of hind tibia present. In male 10th abdominal tergite without furcula; epiphallus with narrow, divided bridge, without ancorae and only with outer pair of lophi. Female ovipositor valves long, slender, evenly toothed.

DISTRIBUTION. Ceylon.

SPECIES INCLUDED***Ochlandriphaga xanthelytrana* Henry**

Ochlandriphaga xanthelytrana Henry, 1933 : 187, pl. 34, figs 1-5. Holotype ♂, CEYLON (BMNH) [examined].

***Thanmoia* Ramme, 1941**

(Text-figs 9, 20-22)

Thanmoia Ramme, 1941 : 119. Type-species: *Thanmoia gustavi* Ramme, by monotypy.

Annamacris Willemse, 1956 : 23. Type-species: *Annamacris olivacea* Willemse, by monotypy.

Syn. n.

Oxyacris Willemse, 1956 : 23. Type-species: *Oxyacris maculata* Willemse, by monotypy.

Syn. n.

DIAGNOSIS. Head conical; fastigium of vertex, from above, rounded pentagonal, wider than long, median longitudinal carinula absent; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes normal. Antenna longer than head and pronotum combined. Prosternal process slender, conical, with subacute or rounded apex. Dorsum of pronotum from subrugulose to smooth, cylindrical or slightly flattened, median carina weak, moderately deeply or shallowly crossed by three transverse sulci, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings fully developed or somewhat shortened; no trace of transverse parallel stridulatory veinlets on tegmen. Lower genicular lobe of hind femur spined; hind tibia expanded in apical half with acute upper margins; external apical spine of hind tibia absent, or very rarely present. In male 10th abdominal tergite with weak furcula on hind margin; epiphallus with narrow divided bridge and ancorae (Text-fig. 20). Female ovipositor valves long, slender, with serrate apices (Text-fig. 9), obviously highly specialized.

DISTRIBUTION. Vietnam.

SPECIES INCLUDED

Thanmoia gustavi Ramme

Thanmoia gustavi Ramme, 1941 : 120, pl. 16, fig. 5. Holotype ♀, NORTH VIETNAM (MNHU Berlin) [examined].

T. olivacea (Willemse) **comb. n.**

Annamacris olivacea Willemse, 1957 : 480. Holotype ♂, NORTH VIETNAM (MNHN, Paris) [examined].

T. maculata (Willemse) **comb. n.**

Oxyacris maculata Willemse, 1957 : 481, pl. 13, fig. 5. Holotype ♂, SOUTH VIETNAM (coll. Willemse) [examined].

DISCUSSION. Superficially these three species appear quite different; *T. gustavi* is a relatively large, robust subrugulose species with fully developed temina and hind wings; *T. maculata* is smaller, more delicate, with smooth integument and is brachypterous; *T. olivacea* is rather intermediate. The male genitalia are very similar in all three species, the epiphallus has a narrow, divided bridge, ancorae, boot-shaped outer lophi and simple inner lophi. I do not consider it necessary to retain these three species in monotypic genera and the above synonymy is made. Apart from the type-specimens there is a female paratype of *T. gustavai* in NM, Vienna and a male and two females of the same species from the type-locality in IEE, Madrid.

Fer I. Bolívar, 1918

(Text-fig. 23)

Fer I. Bolívar, 1918 : 17. Type-species: *Fer coeruleipennis* I. Bolívar, by monotypy.

DIAGNOSIS. Head conical; fastigium of vertex, from above, rounded triangular, about as wide as or slightly wider than long, median longitudinal carinula weakly present; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes slightly bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process long, weakly flattened

posteriorly, slightly expanded subapically and with subacute apex. Dorsum of pronotum rugulose, slightly flattened, shallowly crossed by three transverse sulci, median carina present but weak, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings fully developed, former with transverse parallel stridulatory veinlets present in 1st radial area. Lower genicular lobe of hind femur spined; hind tibia very weakly expanded in apical half, with acute upper margins apically; external apical spine of hind tibia present but very weak. In male 10th abdominal tergite with a furcula on postero-dorsal margin; epiphallus with divided bridge, developed ancorae and two pairs of lophi. Female ovipositor valves slender, evenly toothed.

DISTRIBUTION. Vietnam.

SPECIES INCLUDED

Fer coeruleipennis I. Bolívar

Fer coeruleipennis I. Bolívar, 1918 : 19. Syntypes, 1 ♂ and 1 ♀, NORTH VIETNAM (IEE, Madrid) [examined].

Gesonula Uvarov, 1940

(Text-figs 8, 44)

Gesonina Stål, 1878 : 46. Type-species: *Acridium (Oxya) punctifrons* Stål, by monotypy. [Homonym of *Gesonina* Walker, 1858 : 75.]

Gesonula Uvarov, 1940 : 174. [Replacement name for *Gesonina* Stål.]

DIAGNOSIS. Head conical; fastigium, from above, parabolic, slightly longer than the basal width, without median longitudinal carinula; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes normal. Antenna slightly longer than combined length of head and pronotum. Prosternal tubercle simple, conical with rounded apex. Dorsum of pronotum flattened, shallowly crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace about as wide as long. Tegmina and hind wings fully developed, former with some transverse parallel stridulatory veinlets in 1st radial area. Lower genicular lobe of hind femur spined; hind tibia expanded in apical half, with acute upper margins; external apical spine of hind tibia present. In male postero-dorsal margin of 10th abdominal tergite with furcula fully developed, weak or absent; epiphallus with narrow divided bridge, well developed ancorae and complex lophi. Female ovipositor valves very short with short lateral and longer, curved apical spines.

DISTRIBUTION. Pakistan, eastwards to N. Australia, Solomon Is.

SPECIES INCLUDED

Gesonula punctifrons (Stål)

Acridium (Oxya) punctifrons Stål, 1861 : 336. Holotype ♂, CHINA (NR, Stockholm).

Heteracris tenuis Walker, 1870 : 668. Syntypes ♂ and ♀, CHINA (BMNH) [examined]. [Synonymised by Kirby, 1910 : 393.]

Racilia okinawensis Matsumura, 1910 : 3, pl. 4, fig 7. Syntypes ♂ and ♀, TAIWAN and JAPAN (Okinawa) (coll. Matsumura). [Synonymised by Tinkham, 1935 : 491.]

G. mundata (Walker)

Heteracris mundata Walker, 1870 : 672. Syntypes ♂ and ♀, AUSTRALIA (BMNH) [examined].

Gesonina recticercus Sjöstedt, 1920 : 21. Syntypes ♂ and ♀, AUSTRALIA (NR, Stockholm);

MNHU, Berlin) [examined]. [Synonymized by Sjöstedt, 1935 : 71.]
For subspecies of this species see Rehn, 1952.

G. rehni Akbar & Balock

Gesonula rehni Akbar & Balock, 1970 : 12, pl. 1, figs 1 A-D, pl. 2, figs 1 A-I. Holotype ♂,
PAKISTAN (University of Sind, Janshoro).

Hygracris Uvarov, 1921

(Text-figs 12, 43)

Hygracris Uvarov, 1921 : 505. Type-species: *Hygracris palustris* Uvarov, by monotypy.

DIAGNOSIS. Head conical; fastigium of vertex, from above, parabolic, wider than long, median longitudinal carinula weakly present; frontal ridge sulcate, almost complete to clypeus; lateral facial keels complete. Eyes normal. Antenna slightly longer than combined length of head and pronotum. Prosternal process moderately simple, narrow at base, expanded in apical third and bent backwards, with rounded or subacute apex. Dorsum of pronotum flattened, shallowly crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace longer than wide. Both upper and lower genicular lobes of hind femur spined; hind tibia strongly expanded in apical half, with acute upper margins; external apical spine of hind tibia absent. In male 10th abdominal tergite without a furcula; epiphallus with divided bridge, well developed ancorae and two pairs of lophi. Female ovipositor valves long, slender, evenly toothed.

DISTRIBUTION. India.

SPECIES INCLUDED

Hygracris palustris Uvarov

Hygracris palustris Uvarov, 1921 : 506. Holotype ♂, INDIA (Bengal) (BMNH) [examined].

H. malabaricus Willemse

Hygracris malabaricus Willemse, 1962 : 52, fig. 8. Holotype ♀, INDIA (South-west) (MNHN, Paris).

DISCUSSION. Superficially species of this genus most closely resemble those of *Oxya* but are easily distinguished by the acutely pointed upper genicular lobes of the hind femur. The presence of ancorae and bilobed lophi in the male epiphallus suggest a close relationship with the genera *Thanmoia*, *Fer* and perhaps *Gesonula*.

Quilta Stål, 1860

(Text-figs 3, 4, 11, 59)

Acridium (Quilta) Stål, 1861 : 337. Type-species: *Acridium (Quilta) mitratum* Stål, by monotypy.
Quilta Stål; Stål, 1873 : 80.

DIAGNOSIS. Head elongate conical; fastigium of vertex, from above, steeply parabolic, longer than wide, without median longitudinal carinula; frontal ridge sulcate, complete almost to clypeus; lateral facial keels complete. Eyes somewhat flattened. Antenna short, not

longer than combined lengths of head and pronotum. Prosternal process simple, subconical with slightly bulbous and backward pointing apex. Dorsum of pronotum flattened; median longitudinal carina very weak, barest traces of lateral carinae present, shallowly crossed by three transverse sulci; mesosternal interspace narrow, longer than wide; metasternal lobes contiguous. Tegmina and hind wings fully developed, former without trace of parallel transverse stridulatory veinlets. Both lower and upper genicular lobes of hind femur spined; hind tibia expanded strongly in apical half, with acute upper margins; external apical spine of hind tibia present. In male 10th abdominal tergite with a weak furcula on postero-dorsal margin; epiphallus with narrow divided bridge, without ancorae, and with only outer pair of lophi present. Female ovipositor valves long, upper valves smooth, lower valves weakly spined.

DISTRIBUTION. Thailand, W. Indonesia.

SPECIES INCLUDED

Quilta mitrata (Stål)

Acridium (Quilta) mitratum Stål, 1861 : 337. Syntypes ♂ and ♀, KEELING Is. (MNHU, Berlin; NR, Stockholm) [examined].

Q. oryzae Uvarov

Quilta oryzae Uvarov, 1925 : 159, figs 3-5. Holotype ♀, THAILAND (BMNH) [examined].

Q. deschauenseei Rehn

Quilta deschauenseei Rehn, 1957 : 6. Holotype ♀, THAILAND (ANS, Philadelphia).

Stolzia Willemse, 1930

(Text-figs 31-37)

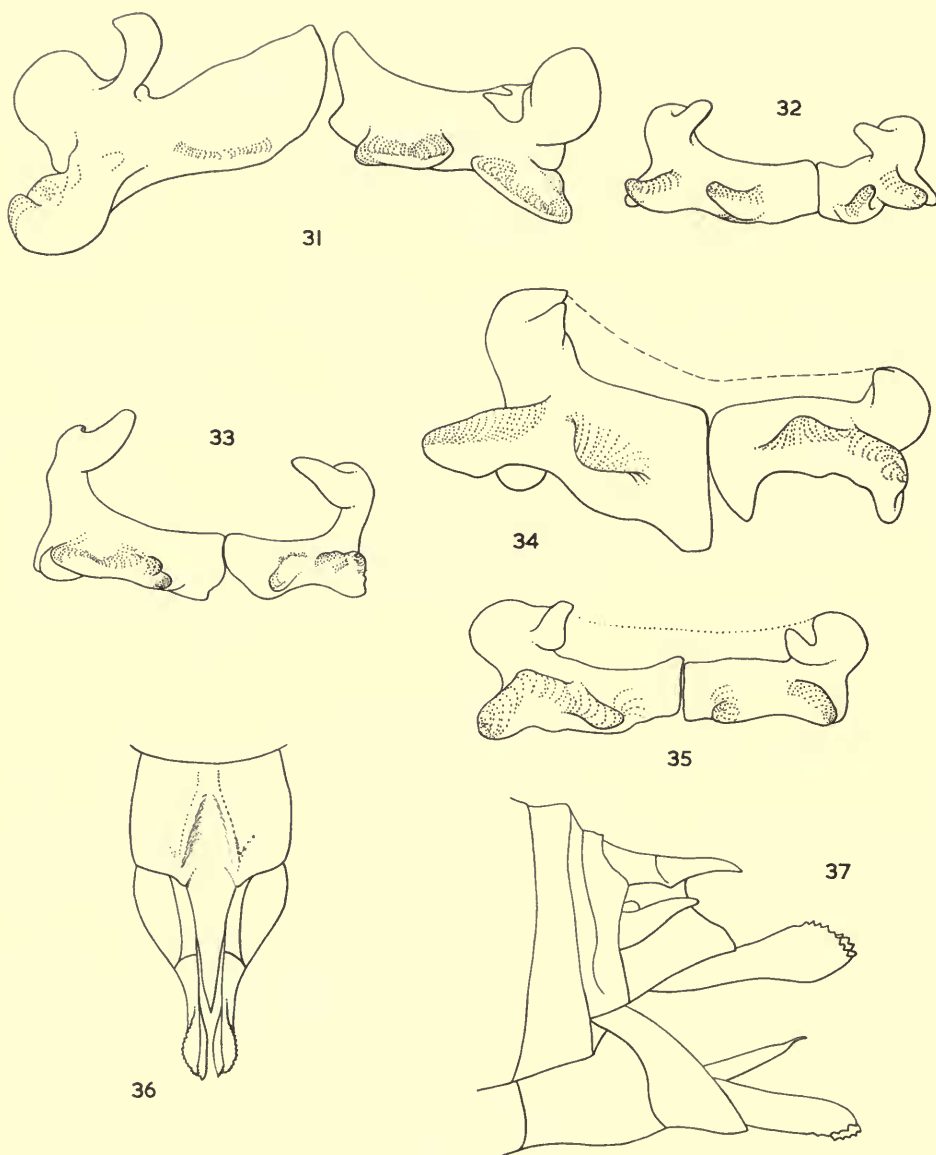
Stolzia Willemse, 1930 : 117. Type-species: *Stolzia rubromaculata* Willemse, by monotypy.

Incolacris Willemse, 1932 : 150. Type-species: *Incolacris rubritarsi* Willemse, by original designation (Willemse, 1932 : 151). **Syn. n.**

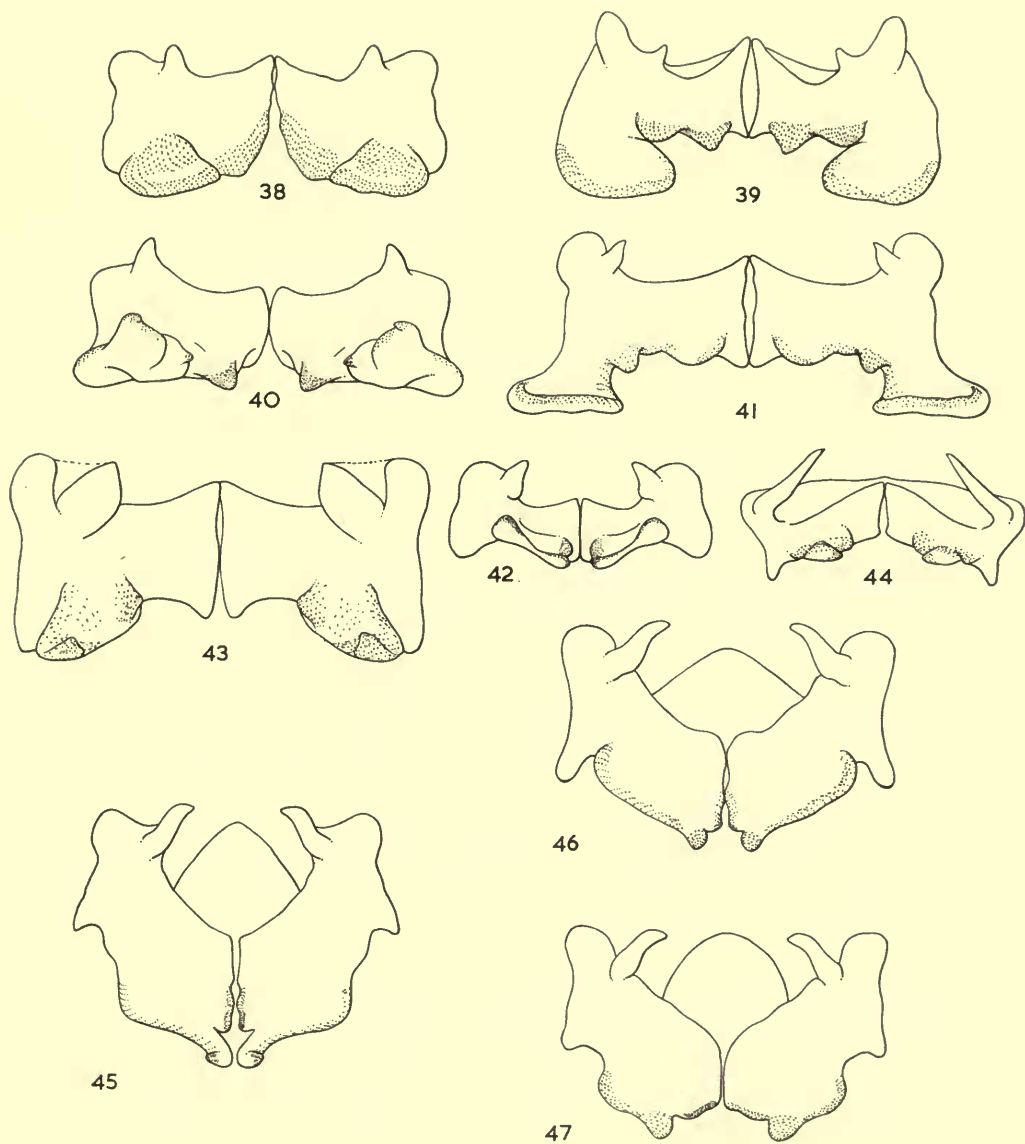
Butonacris Willemse, 1933 : 6. Type-species: *Butonacris fasciata* Willemse, by monotypy. **Syn. n.**

DIAGNOSIS. Head conical; fastigium of vertex, from above, rounded pentagonal, about as wide as long, median longitudinal carinula absent; frontal ridge sulcate, tending to evanesce below median ocellus; lateral facial keels complete. Eyes bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process short, pyramidal, apex subacute. Dorsum of pronotum rugulose, slightly flattened at least in metazona, median carina weak, lateral carinae absent, moderately deeply crossed by three transverse sulci; mesosternal interspace wider than long. Lower genicular lobe of hind femur spined; hind tibia hardly expanded apically; external apical spine of hind tibia present. In male 10th abdominal tergite with furcula on postero-dorsal margin; supra-anal plate tuberculate; epiphallus asymmetrical, left side larger and with more strongly developed lophi, with divided bridge and developed ancorae. Female ovipositor valves long and slender with apices somewhat spatulate and evenly spined.

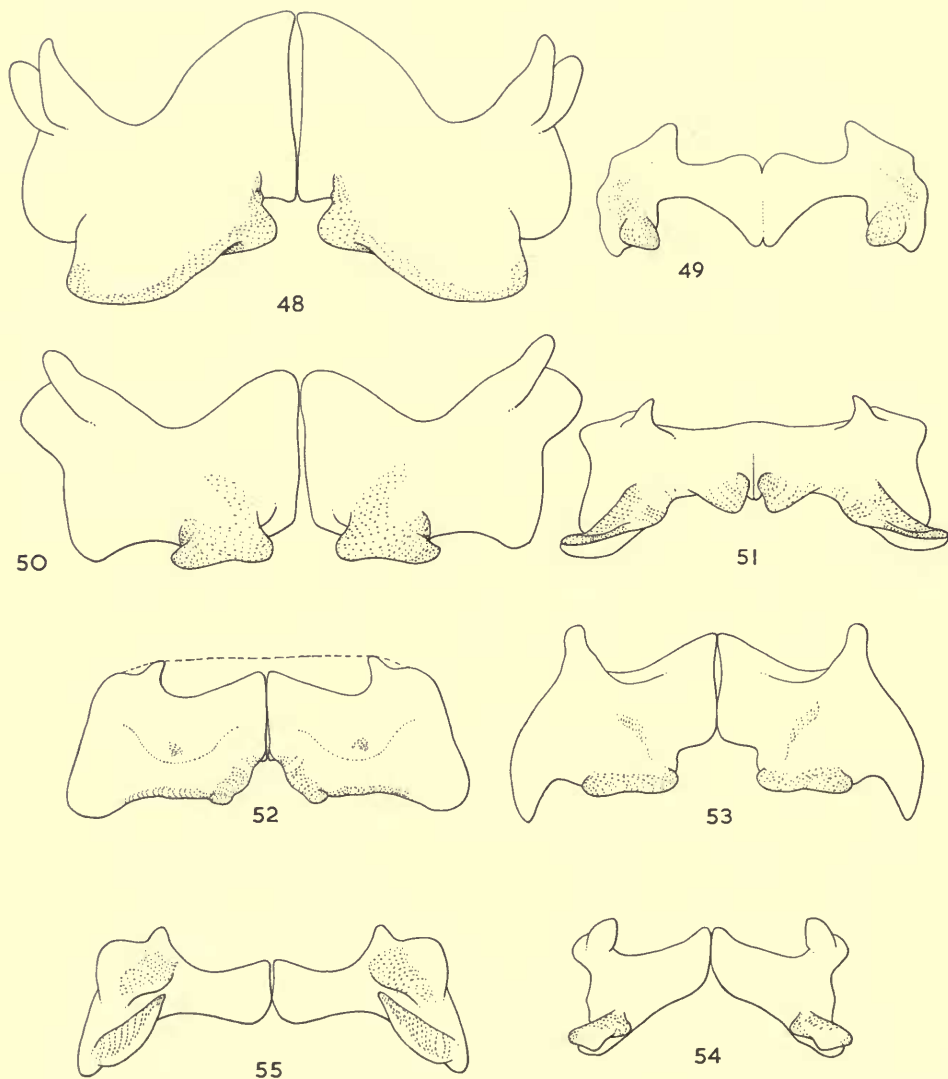
DISTRIBUTION. China, W. Indonesia, Philippine Is.



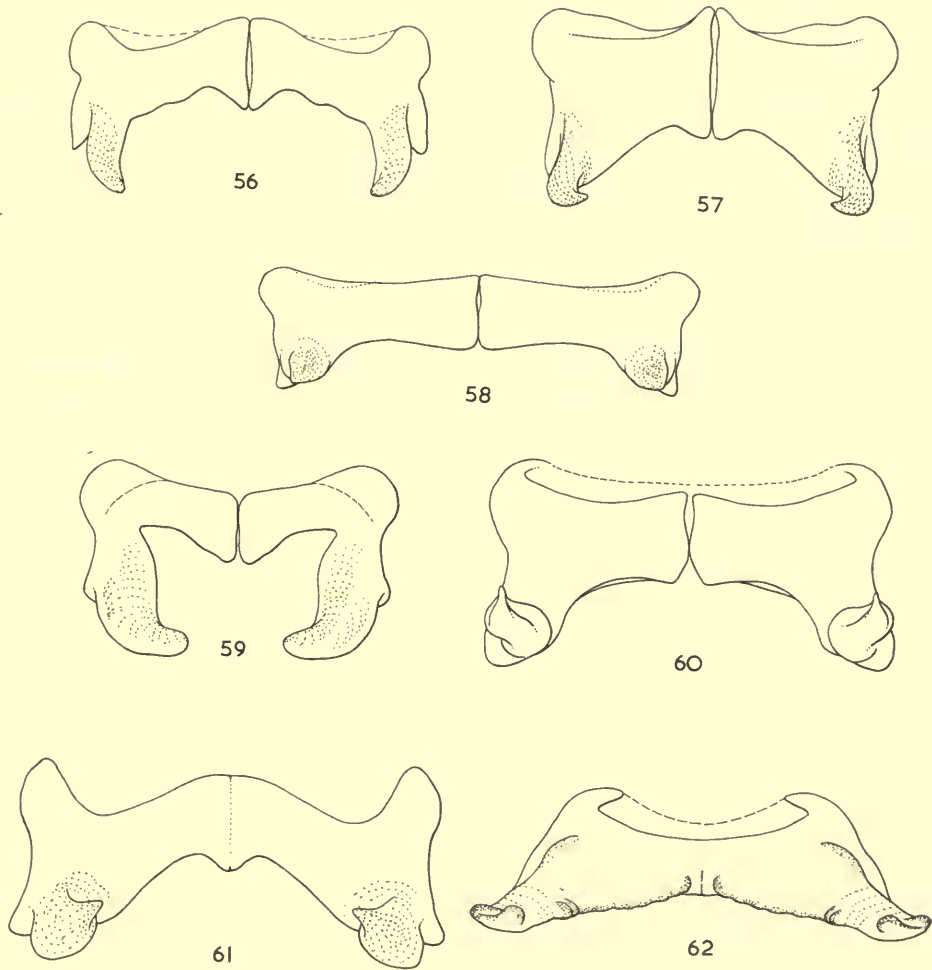
FIGS 31-37. *Stolzia* species. Male and female genitalia. *S. borneensis* (Willemse), 31, male epiphallus; *S. aberrans* (Willemse), 32, male epiphallus; *S. javana* Ramme, 33, male epiphallus; *S. trifasciata* (Willemse) 34, male epiphallus; *S. fasciata* (Willemse), 35, male epiphallus; *S. rubritarsi* (Willemse), 36, female ovipositor, ventral view; 37, same, lateral view.



FIGS 38-47. Oxyinae genera, male epiphalli. 38, *Caryanda diminuta* (Walker). 39, *C. paravicina* (Willemse); 40, *C. modesta* (Giglio-Tos); 41, *C. cylindrica* (Ramme); 42, *C. palawana* (Ramme); 43, *Hygracris palustris* Uvarov; 44, *Gesonula punctifrons* (Stål); 45, *Oxyina bidentata* (Willemse); 46, *O. javana* (Willemse); 47, *O. sinobidentata* (Hollis).



FIGS 48-55. Oxyinae genera, male epiphalli. 48, *Badistica fascipes* Chopard; 49, *B. bellula* Karsch; 50, *B. margarita* Jago; 51, *B. simpsoni* Ramme; 52, *B. ornata* I. Bolívar; 53, *B. lauta* Karsch; 54, *Gerista dimidiata* I. Bolívar; 55, *Lucretilis jucunda* Miller.



FIGS 56-62. Oxyinae genera, male epiphalli. 56, *Cercina obtusa* Stål; 57, *Bumacris flavomaculata* Willemse; 58, *Ochlandriphaga xanthelytrana* Miller; 59, *Quilta oryzae* Uvarov; 60, *Cylindrotillus versicolor* Ramme; 61, *Digentia rufogeniculata* (I. Bolivar); 62, *D. punctatissima* (Stål).

SPECIES INCLUDED

Stolzia rubromaculata Willemse

Stolzia rubromaculata Willemse, 1930 : 118, fig. 58. Holotype ♂, SUMATRA (coll. Willemse) [examined].

S. rubritarsi (Willemse) **comb. n.**

Incolacris rubritarsi Willemse, 1932 : 151. Holotype ♀, PHILIPPINE IS. (coll. Willemse) [examined].

S. trifasciata (Willemse) **comb. n.**

Incolacris trifasciata Willemse, 1932 : 152. Holotype ♂, PHILIPPINE IS. (coll. Willemse) [examined].

S. fasciata (Willemse) **comb. n.**

Butonacris fasciata Willemse, 1933 : 118, fig. 4. Holotype ♂, SULAWESI (Buton I.) (NM, Vienna) [examined].

Incolacris atrifrons Willemse, 1956 : 186. Holotype ♀, SULAWESI (Buton I.) (coll. Willemse) [examined]. **Syn. n.**

S. borneensis (Willemse) **comb. n.**

Butonacris borneensis Willemse, 1938 : 83, fig. 1. Holotype ♂, BORNEO (Central) (RNH, Leiden) [1 ♂ paratype examined].

S. aberrans (Willemse) **comb. n.**

Butonacris aberrans Willemse, 1938 : 84, fig. 2. Holotype ♂, BORNEO (Central) (coll. Willemse) [examined].

S. nigromaculata (Willemse) **comb. n.**

Butonacris nigromaculata Willemse, 1938 : 120, fig. 5. Holotype ♂, BORNEO (North) (UM, Oxford) [could not trace].

S. flavomaculata (Willemse) **comb. n.**

Incolacris flavomaculata Willemse, 1939 : 75, 89, fig. 3. Holotype ♀, MALAYA (Malacca) (coll. Willemse) [examined].

S. hainanensis (Tinkham) **comb. n.**

Incolacris hainanensis Tinkham, 1940 : 302, pl. 11, fig. 2. Holotype ♂, CHINA (Hainan) (? depository).

S. javana Ramme

Stolzia javana Ramme, 1941 : 101, pl. 13, fig. 5. Holotype ♀, JAVA (MNHU, Berlin) [examined].

DISCUSSION. Willemse separated *Stolzia* from *Butonacris* and *Incolacris* because of the incomplete frontal ridge of *S. rubromaculata*, and *Incolacris* species were separated on the basis of the sculpturing of the metazona. Neither of these characters is considered here to be of any significance at the generic level and the three genera are synonymized.

By far the most remarkable feature of this genus is the asymmetrical development of the male epiphallus. As far as I am aware this has not occurred in any other group of Acridoidea although it was noted, to a relatively minor extent, in *Oxya fuscovittata* (Marschall) (Hollis, 1971). Also the latter species has weakly developed tubercles on the male supra-anal plate, another feature more strongly developed in *Stolzia* species.

Caryanda Stål, 1878

(Text-figs 38-42)

Caryanda Stål, 1878 : 47. Type-species: *Acridium (Oxya) spurium* Stål, by monotypy.*Dibastica* Giglio-Tos, 1907 : 9. Type-species: *Dibastica modesta* Giglio-Tos, by monotypy.**Syn. n.***Austenia* Ramme, 1929 : 331. Type-species: *Austenia cylindrica* Ramme, by monotypy.[Homonym of *Austenia* Nevill, 1878 : 16.] **Syn. n.***Austeniella* Ramme, 1931 : 934. [Replacement name for *Austenia* Ramme]. **Syn. n.**

DIAGNOSIS. Head conical; fastigium of vertex, from above, pentagonal, wider than long, without median longitudinal carinula; frontal ridge sulcate. Eyes normal. Antenna as long as combined lengths of head and pronotum. Prosternal process conical with subacute apex. Dorsum of pronotum weakly flattened, median carina weak, lateral carinae absent, weakly crossed by three transverse sulci; mesosternal interspace slightly longer than wide. Tegmina and hind wings normally reduced to micropterous condition, some species brachypterous and one species is rarely macropterous. Lower genicular lobe of hind femur spined; hind tibia hardly expanded apically, upper margins acute, external apical spine present. In male 10th abdominal tergite with or rarely without furcula on hind margin; epiphallus with divided bridge and clearly developed ancorae. Female ovipositor valves long, slender, evenly toothed.

DISTRIBUTION. C. Africa, India, Burma, China, Indo-China, W. Indonesia, Philippine Is.

SPECIES INCLUDED

Caryanda spuria (Stål)*Acridium (Oxya) spurium* Stål, 1861 : 336. Holotype ♂, JAVA (NR, Stockholm) [examined].*C. diminuta* (Walker) **comb. n.***Oxya diminuta* Walker, 1871 : 64. Holotype ♀, CHINA (Yunan) (BMNH) [examined].*Oxya rufipes* Brunner von Wattenwyl, 1893 : 153. Lectotype ♂, CAMBODIA (NM, Vienna), designated by Hollis (1971 : 336) [examined]. [Synonymized by Willemse, 1921 : 42].*C. sanguineoannulata* Brunner von Wattenwyl*Caryanda sanguineoannulata* Brunner von Wattenwyl, 1893 : 154, pl. 5, fig. 52. Holotype ♂, BURMA (MCSN, Genoa).*C. modesta* (Giglio-Tos) **comb. n.***Dibastica modesta* Giglio-Tos, 1907 : 10. Holotype ♀, ZAIRE (IRSNB, Brussels).*Dibastica major* I. Bolívar, 1908 : 106. Holotype ♀, ZAIRE (IRSNB, Brussels). [Synonymised by Descamps & Donskoff, 1964 : 1204].*Dibastica viridis* I. Bolívar, 1908 : 106. Holotype ♀, ZAIRE (IRSNB, Brussels). [Synonymised by Ramme, 1929 : 328].*Dibastica elegans* I. Bolívar, 1911 : 302. Holotype ♂, ZAIRE (MRAC, Tervuren). [Synonymised by Descamps & Donskoff, 1968 : 1204].*C. cachara* (Kirby)*Traulia cachara* Kirby, 1914 : 245, fig. 132. Holotype ♀, INDIA (Assam) (BMNH) [examined].*C. elegans* I. Bolívar**Caryanda elegans* I. Bolívar, 1918 : 20. Syntypes ♂ BURMA, 2 ♀ NORTH VIETNAM (IEE, Madrid) [examined, almost certainly a mixed series].

* The homonymy created here can be resolved when Dr. Fer Willemse publishes his revision of the genus.

***C. pumila* Willemse**

Caryanda pumila Willemse, 1924 : 158. Holotype ♂, SUMATRA (RNH, Leiden).

***C. paravicina* (Willemse) comb. n.**

Oxya paravicina Willemse, 1925b : 55, figs 62, 63. Holotype ♂, INDIA (North-east) (NM, Vienna) [examined].

***C. cylindrica* (Ramme) comb. n.**

Austenia cylindrica Ramme, 1929 : 332, pl. 7, figs 10, 11; figs 46a, 47a, 48a. Holotype ♂, SIERRA LEONE (BMNH) [examined].

***C. methiola* Chang**

Caryanda methiola Chang, 1939 : 43, pl. 1, figs 5, 6, 9, pl. 3, fig. 4. Holotype ♀, CHINA (Szechwan) (USNM Washington).

***C. sinensis* Chang**

Caryanda sinensis Chang, 1939 : 45, pl. 1, figs 3, 4, 7, pl. 3, fig. 2. Holotype ♀, CHINA (Szechwan) (USNM, Washington).

***C. omeiensis* Chang**

Caryanda omeiensis Chang, 1939 : 47, pl. 1, fig. 8. Holotype ♀, CHINA (Szechwan) (USNM, Washington).

***C. pieli* Chang**

Caryanda pieli Chang, 1939 : 48, pl. 2, figs 1-4, pl. 3, figs 1, 7. Holotype ♀, CHINA (Chekiang) (? depository).

***C. palawana* (Ramme) comb. n.**

Chitaurella palawana Ramme, 1941 : 137. Holotype ♂, PHILIPPINE IS. (Palawan) (NM, Vienna) [examined].

***C. olivacea* Willemse**

Caryanda olivacea Willemse, 1956 : 168. Holotype ♂, NORTH VIETNAM (NM, Vienna) [examined].

SPECIES DOUBTFULLY INCLUDED

***C. pulchra* Brancsik**

Caryanda pulchra Brancsik, 1897 : 74, pl. 3, figs 17a, b. Holotype ♂, NEW GUINEA (probably lost).

***C. flavomaculata* I. Bolívar**

Caryanda flavomaculata I. Bolívar, 1918 : 21. Holotype ♂, NEW GUINEA (IEE, Madrid) [examined].

DISCUSSION. There seems to be no valid reason on the basis of external morphology or in the structure of the male phallic complex why *Austeniella* and *Dibastica* should remain separate from *Caryanda* and they are therefore synonymised.

As mentioned in my earlier paper on *Oxya* (Hollis, 1971) that genus was considered to be a somewhat heterogeneous assemblage of species and some rearrangement would be necessary. *O. paravicina* and *O. diminuta* clearly differ from other species of *Oxya* (sensu stricto) in that a male furcula is present and the epiphallus bears ancorae. These two species are considered here more naturally grouped in *Caryanda*.

Chitaurella palawana is clearly not congeneric with *C. lucida* Krauss, having a simple, conical prosternal process. It seems to be more closely allied to the *Caryanda*

species and is placed in that genus. The holotype male has the external apical spine of the hind tibia present only on the right side, but another male from Palawan, deposited in MNHN, Paris, has the spine on both tibiae.

The identity of *Caryanda pulchra* will remain obscure until topotypic material becomes available for study.

Caryanda flavomaculata differs from the rest of the genus in having deep transverse sulci on the pronotum, the male furcula is absent, the epiphallus lacks ancorae and is very similar to the type found in *Oxya*. In view of these differences it is likely that *C. flavomaculata* should be placed in another genus but, as it is only known from a discoloured male dried from alcohol, there is insufficient information available and the current combination is maintained.

Gerista I. Bolívar, 1905

(Text-fig. 54)

Gerista I. Bolívar, 1905 : 233. Type-species: *Gerista dimidiata* I. Bolívar, by monotypy.

DIAGNOSIS. Head conical; fastigium, from above, rounded pentagonal, wider than long, median longitudinal carinula absent; frontal ridge sulcate, evanescent below median ocellus; lateral facial keels complete. Eyes bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process conical with subacute apex. Dorsum of pronotum slightly flattened, shallowly crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace about as long as wide. Tegmina and hind wings reduced, former extending only half-way along abdomen and without trace of transverse parallel stridulatory veinlets. Lower genicular lobe of hind femur spined; hind tibia expanded in apical part, with acute upper margins apically; external apical spine of hind tibia absent. In male roth abdominal tergite without a furcula; epiphallus with divided bridge, ancorae and only an outer pair of lophi. Female ovipositor valves long, slender, evenly toothed.

DISTRIBUTION. Nigeria, Fernando Po.

SPECIES INCLUDED

Gerista dimidiata I. Bolívar

Gerista dimidiata I. Bolívar, 1905 : 234. Holotype ♂, FERNANDO PO (IEE, Madrid) [examined].

DISCUSSION. *Gerista* is the only African genus in the Oxyinae lacking the external apical spines of the hind tibia. However, this feature is not regarded as very significant here and, on the evidence from the form of the male epiphallus, *Gerista* appears most closely related to the *lauta* species-group of *Badistica*.

The female of this species was described by Jago (1962) from the Benin forest region of Nigeria but it may be that Jago's material represents a mainland species distinct from that found on Fernando Po.

***Badistica* Karsch, 1891**

(Text-figs 48-53)

Badistica Karsch, 1891 : 194. Type-species: *Badistica bellula* Karsch, by monotypy.

DIAGNOSIS. Head conical; fastigium, from above, pentagonal, wider than long, median longitudinal carinula absent; frontal ridge sulcate, complete to clypeus or evanescent below median ocellus; lateral facial keels complete. Eyes moderately bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process conical with subacute apex. Dorsum of pronotum rounded or slightly flattened, shallowly or more deeply crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings very reduced, scale-like. Lower genicular lobe of hind femur spined; hind tibia hardly expanded apically, upper margins hardly angular; external apical spine of hind tibia present. In male 10th abdominal tergite with or without furcula on postero-dorsal margin; epiphallus with partially or completely divided bridge, ancrae more or less developed. Female ovipositor valves long, slender, smooth, finely serrate in apical quarter or evenly toothed in apical half.

DISTRIBUTION. W. Africa.

SPECIES INCLUDED

***Badistica bellula* Karsch**

Badistica bellula Karsch, 1891 : 195, figs. Syntypes ♂ and ♀, CAMEROUN (MNHU, Berlin) [examined].

***B. lauta* Karsh**

Badistica lauta Karsch, 1896 : 282, figs 16, 16a. Lectotype ♂, TOGO (MNHU, Berlin), designated by Jago (1966 : 340) [examined].

***B. ornata* I. Bolívar**

Badistica ornata I. Bolívar, 1905 : 229. Holotype ♂, GHANA (MNHU, Berlin) [examined].

***B. simpsoni* Ramme**

Badistica simpsoni Ramme, 1929 : 336, figs 52b, 53b. Holotype ♂, SIERRA LEONE (BMNH) [examined].

***B. fascipes* Chopard**

Badistica fascipes Chopard, 1958 : 128, fig. 1. Holotype ♀, GUINEA: Mt. Nimba (MNHN, Paris).

***B. margarita* Jago**

Badistica margarita Jago, 1966 : 331, figs 1A, 1B, 2A. Holotype ♂, GHANA (BMNH) [examined].

DISCUSSION. Jago (1966) suggests *bellula* and *simpsoni* form one species-group and *lautu*, *fascipes* and *margarita* another, with *ornata* rather intermediate. *B. bellula* and *simpsoni* are distinct from the other species of the genus in that the male epiphallus is incompletely divided (Text-figs 49, 51), a feature altogether rare in the whole subfamily. Furthermore, in these two species the pronotum is flatter and less 'waisted'. Whether these differences are due to divergence within the genus or convergence of two lines of evolution remains uncertain.

***Oxya* Audinet-Serville, 1831**

(Text-figs 7, 10, 13-19)

Oxya Audinet-Serville, 1831 : 286. Type-species: *Oxya hyla* Audinet-Serville, by monotypy. *Zulua* Ramme, 1929 : 327. Type-species: *Zulua glabra* Ramme, by monotypy. **Syn. n.**

DIAGNOSIS. Head conical; fastigium, from above, rounded pentagonal, wider than long, with weak or without median longitudinal carinula; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes normal. Antenna longer or shorter than combined lengths of head and pronotum. Prosternal process conical with subacute or rounded apex. Dorsum of pronotum flattened or slightly rounded, weakly crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings fully developed or reduced to brachypterous condition, former always touching in mid dorsal line when folded and without trace of transverse parallel stridulatory veinlets. Lower genicular lobe of hind femur spined; hind tibia expanded in apical half and with acute upper margins. In male 10th abdominal tergite without furcula; epiphallus with divided bridge, without ancorae and with two pairs of lophi. Female ovipositor valves long, slender, unevenly spined or evenly serrate.

DISTRIBUTION. Ethiopian, S.E. Palaearctic, Oriental, Austro-Oriental, Australasian regions.

SPECIES INCLUDED

(For synonymy and subspecies of these species see Hollis, 1971)

Oxya velox (Fabricius)

Gryllus velox Fabricius, 1787 : 239. Lectotype ♀, CHINA (UZM, Copenhagen), designated by Hollis (1971 : 297) [examined].

O. chinensis (Thunberg)

Gryllus chinensis Thunberg, 1815 : 253. Holotype ♀, CHINA (ZIUU, Uppsala) [examined].

O. japonica (Thunberg)

Gryllus japonicus Thunberg, 1824 : 429. Holotype ♀, JAPAN (ZIUU, Uppsala) [examined].

O. hyla Audinet-Serville

Oxya hyla Audinet-Serville, 1831 : 287. Neotype ♂, SENEGAL (MNHN, Paris), designated by Hollis (1971 : 282) [examined].

O. fuscovittata (Marschall)

Gryllus fuscovittatus Marschall, 1836 : 211, pl. 18, fig. 3. Holotype ♀, no data [probably N.W. India] (NM, Vienna) [examined].

O. nitidula (Walker)

Acridium nitidulum Walker, 1870 : 631. Holotype ♀, INDIA (South) (BMNH) [examined].

O. cyanoptera Stål **comb. rev.**

Oxya cyanoptera Stål, 1873 : 83. Holotype ♀, SIERRA LEONE (NR, Stockholm) [examined].

O. cyanipes (Karny) **comb. n.**

Catantops cyanipes Karny, 1907 : 330, pl. 2, figs 11-15. Holotype ♂, UGANDA (NM, Vienna) [examined].

O. yezoensis Shiraki

Oxya yezoensis Shiraki, 1910 : 43. Neotype ♂, JAPAN (ZIHU, Sapporo), designated by Hollis (1971 : 326) [examined].

O. minuta Carl

Oxya minuta Carl, 1916 : 472. Lectotype ♂, JAVA (MNH, Geneva), designated by Hollis (1971 : 293) [examined].

O. grandis Willemse

Oxya grandis Willemse, 1925b : 36, figs 34, 35. Holotype ♂, INDIA (BMNH) [examined].

***O. glabra* (Ramme) comb. n.**

Zulua glabra Ramme, 1929 : 327, pl. 3, figs 3, 4, fig. 44. Holotype ♂, SOUTH AFRICA, (BMNH) [examined].

***O. agavisia* Tsai**

Oxya agavisia Tsai, 1931 : 437, fig. 1. Holotype ♀, CHINA (MNHU, Berlin) [examined].

***O. ningpoensis* Chang**

Oxya ningpoensis Chang, 1934 : 190, figs 1-3. Syntypes ♂ and ♀, CHINA (partly in BMNH) [partly examined].

***O. stresemanni* Ramme**

Oxya stresemanni Ramme, 1941 : 213. Holotype ♂, SULAWESI (MNHU, Berlin) [examined].

***O. oxyura* Uvarov comb. rev.**

Oxya oxyura Uvarov, 1953 : 68, fig. 71. Holotype ♂, ANGOLA, (BMNH) [examined].

***O. bolaangensis* Hollis**

Oxya bolaangensis Hollis, 1971 : 312, figs 25, 138, 150-159. Holotype ♂, SULAWESI (coll. Willemse) [examined].

DISCUSSION. When *Oxya* was revised by the author (Hollis, 1971) it was realised that some of the species then included in the genus would have to be removed to other genera and this is done here with the removal of *O. diminuta* and *O. paravicina* to *Caryanda* (p. 217), and *O. bidentata*, *sinobidentata* and *javana* to the new genus *Oxyina* (p. 228). It was also noted that the position of *Zulua*, a purely African genus, as a discrete taxon, was not satisfactory. *Zulua* was differentiated by Dirsh (1965 : 235) from *Oxya* by its more acute head profile, shorter antennae, the presence of a weak median longitudinal carinula on the fastigium, the subcylindrical pronotum and a tendency to shortened elytra. These features, although serving to separate *Zulua* species from *Oxya hyla hyla*, break down when *Zulua* is compared with the Oriental *Oxya* species and the two genera are synonymised.

***Bumacris* Willemse, 1931**

(Text-fig. 57)

Bumacris Willemse, 1931b : 348. Type-species: *Bumacris flavomaculata* Willemse, by monotypy.

DIAGNOSIS. Head conical; fastigium of vertex, from above, pentagonal, wider than long, without median longitudinal carinula; frontal ridge sulcate, complete almost to clypeus; lateral facial keels complete. Eyes bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process conical with subacute apex. Dorsum of pronotum rounded or weakly flattened, shallowly or more deeply crossed by three transverse sulci, median carina weak, lateral carinae absent; mesosternal interspace as long as or slightly longer than wide. Tegmina and hind wings fully developed or slightly reduced and only extending two-thirds the length of abdomen; no trace of transverse parallel stridulatory veinlets. Lower genicular lobe of hind femur spined; hind tibia expanded in apical half, and with acute upper margins; external apical spine of hind tibia present. In male 10th abdominal tergite without furcula; epiphallus with broad, divided bridge, without ancorae and with only the outer pair of lophi. Female ovipositor valves very long, slender, evenly toothed.

DISTRIBUTION. Solomon Is.

SPECIES INCLUDED

***Bumacris flavomaculata* Willemse**

Bumacris flavomaculata Willemse, 1931b : 350, fig. 4. Holotype ♂, SOLOMON Is. (Malaita) (NM, Basle).

***B. monotona* Willemse**

Bumacris monotona Willemse, 1935b : 166. Holotype ♀, SOLOMON Is. (Guadalcanal) (BMNH) [examined].

***B. pagdeni* Willemse**

Bumacris pagdeni Willemse, 1935b : 167. Holotype ♂, SOLOMON Is. (Vella Lavella) (BMNH) [examined].

***B. leveri* Uvarov**

Bumacris leveri Uvarov, 1937 : 17. Holotype ♀, SOLOMON Is. (Isabel) (BMNH) [examined].

***B. bougainvillea* Ramme**

Bumacris bougainvillea Ramme, 1941 : 118. Holotype ♂, SOLOMON Is. (Bougainville) (MNHU, Berlin).

***B. georgica* Willemse**

Bumacris georgica Willemse, 1962 : 51, fig. 4. Holotype ♂, SOLOMON Is. (St. George) (MNHN, Paris).

DISCUSSION. Dr Fer Willemse will shortly be publishing a thorough revision of this genus.

***Digentia* Stål, 1878**

(Text-figs 61, 62)

Digentia Stål, 1878 : 47. Type-species: *Oxya punctatissima* Stål, by monotypy.

Genditia I. Bolívar, 1911 : 301. Type-species: *Genditia rufogeniculata* I. Bolívar, by monotypy.

Syn. n.

DIAGNOSIS. Head conical; fastigium, from above, rounded pentagonal, wider than long, with or without median longitudinal carinula; frontal ridge sulcate, complete to clypeus; lateral facial keels complete. Eyes moderately bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process simple, conical with subacute apex. Dorsum of pronotum rugulose and coarsely pitted, rounded or weakly flattened, moderately deeply crossed by three transverse sulci; median carina weak, lateral carinae absent; mesosternal interspace about as wide as long. Tegmina and hind wings very reduced, former minute and not extending beyond mesonotum or scale-like and extending to 1st abdominal tergite. Lower genicular lobe of hind femur spined; hind tibia weakly or moderately expanded in apical part and with acute upper margins apically; external apical spine of hind tibia present. In male posterodorsal margin of 10th abdominal tergite with a weak furcula or if without then it is expanded dorso-laterally; epiphallus with incompletely divided bridge and without ancorae. Female ovipositor valves long, slender, smooth or evenly and weakly serrate in apical half.

DISTRIBUTION. W. and C. Africa.

SPECIES INCLUDED

***Digentia punctatissima* (Stål)**

Oxya punctatissima Stål, 1875 : 33. Holotype ♂, W. AFRICA (NR, Stockholm) [examined].

***D. rufogeniculata* (I. Bolívar) comb. n.**

Genditia rufogeniculata I. Bolívar, 1911 : 301. Holotype ♀, ZAIRE (Kasai) (MRAC, Tervuren).

***D. fasciata* Ramme**

Digentia fasciata Ramme, 1929 : 323, figs 40, 41b. Holotype ♂, CAMEROUN (MNHU, Berlin) [examined].

***D. karnyi* Ramme sp. rev.**

Digentia karnyi Ramme, 1929 : 331, pl. 7, fig. 9. Holotype ♀, ZAIRE (MRAC, Tervuren) [1 ♀ paratype examined].

DISCUSSION. Prior to this review *Digentia* included two recognised species, the type-species *punctatissima* and *fasciata*. *Genditia* was erected for *rufogeniculata* and Dirsh (1952) added *versicolor* (Ramme). Considering the two type-species there seem to be no differences upon which to base a generic separation. *D. punctatissima* has more reduced organs of flight, less expanded hind tibiae and smooth ovipositor valves, features which can be clearly associated with a more or less complete adaptation to a forest habitat. Furthermore, as both *punctatissima* and *rufogeniculata* have the male epiphallus with an incompletely divided bridge, the two genera are synonymised. *D. versicolor* is significantly different from the two former species as the male epiphallus has a completely divided bridge, the integument is much less coarsely pitted, the antennae are very short and the overall appearance is very different to the other *Digentia* species. It is therefore removed from *Digentia* and replaced in its original combination as *Cylindrotiltus versicolor* Ramme, 1929.

In the female paratype of *Digentia karnyi* Ramme the tegmina appear narrower than in *rufogeniculata*, also the posterior margin of the subgenital plate is sharply triangular and the ventral concavity more rounded. For these reasons Dirsh's synonymy (1952 : 268) is not accepted.

***Cercina* Stål, 1878**

(Text-figs 1, 56)

Cercina Stål, 1878 : 49, 97. Type-species: *Cercina obtusa* Stål, by monotypy.

Cledra I. Bolívar, 1918 : 25. Type-species: *Cledra simoni* I. Bolívar, by monotypy. [Synonymised by Uvarov, 1927 : 105.]

DIAGNOSIS. Head conical; fastigium, from above, short triangular or pentagonal, wider than long, median longitudinal carinula absent; frontal ridge weakly sulcate and not quite extending to clypeus; lateral facial keels complete. Eyes normal. Antenna shorter than combined lengths of head and pronotum. Prosternal process subconical, antero-posteriorly flattened with subacute apex. Dorsum of pronotum flattened, shallowly crossed by two or three transverse sulci, median carina very weak, lateral carinae absent; mesosternal interspace longer than wide. Tegmina and hind wings reduced, scale-like, former not extending beyond 3rd abdominal tergite. Lower genicular lobe of hind femur pointed or spined; hind tibia moderately expanded in apical half; with acute upper margins; external apical spine of hind tibia present. In male 10th abdominal tergite without furcula; epiphallus with narrow divided bridge, without ancorae and with only the outer pair of lophi. Female ovipositor valves long, slender, evenly toothed.

DISTRIBUTION. Ceylon.

SPECIES INCLUDED

Cercina obtusa Stål

Cercina obtusa Stål, 1878 : 97. Holotype ♀, CEYLON (NM, Vienna).

Cledra simoni I. Bolívar, 1918 : 26. Holotype ♂, CEYLON (IEE, Madrid) [examined].
[Synonymised by Uvarov, 1927 : 105].

Caryanda platycera Willemse, 1924 : 157, fig. 1. Holotype ♂, CEYLON (NM, Vienna) [examined]. **Syn. n.**

C. phillipsi Henry

Cercina phillipsi Henry, 1933 : 184, pl. 33, figs 1, 2. Holotype ♂, CEYLON, (BMNH) [examined].

DISCUSSION. An examination of the type of *Caryanda platycera* has shown that this species should be transferred to *Cercina* and that it is synonymous with *C. obtusa*.

Cylindrotiltus Ramme, 1929 **gen. rev.**

(Text-figs 2, 60)

Cylindrotiltus Ramme, 1929 : 319. Type-species: *Cylindrotiltus versicolor* Ramme, by monotypy.

DIAGNOSIS. Head conical; fastigium, from above, rounded pentagonal, wider than long, without median longitudinal carinula; frontal ridge sulcate, evanescent just above clypeus; lateral facial keels complete. Eyes moderately bulbous. Antenna not longer than combined lengths of head and pronotum. Prosternal process conical, posteriorly flattened, with subacute apex. Dorsum of pronotum with smooth shiny integument except in metazona where it is more coarsely pitted, rounded, deeply crossed by three transverse sulci; median carina almost completely absent, lateral carinae absent; mesosternal interspace as wide as or longer than wide. Tegmina and hind wing reduced, scale-like, former only just extending beyond hind margin of 1st abdominal tergite. Lower genicular lobe of hind femur spined; hind tibia slightly expanded in apical half and with acute upper margins; external apical spine of hind tibia present. In male 10th abdominal tergite without furcula; epiphallus with divided bridge, without ancorae. Female ovipositor valves long, slender, evenly and finely serrate.

DISTRIBUTION W. Africa.

SPECIES INCLUDED

Cylindrotiltus versicolor Ramme **comb. rev.**

Cylindrotiltus versicolor Ramme, 1929 : 320, figs 37, 38, pl. 6, figs 24, 25. Holotype ♂, CAMEROUN (MNHU, Berlin) [examined].

DISCUSSION. The reasons for resurrecting this monobasic genus from synonymy with *Genditia* are given on p. 224. Very little is known of the biology of *C. versicolor* but it would appear to be a forest-living species. On the evidence from external morphology and the male phallic complex it seems to be most closely related to *Pterotiltus*, being a little less specialised to forest life than the latter.

***Pterotiltus* Karsch, 1893**

(Text-figs 63-69)

Pygostolus Karsch, 1891 : 192. Type-species: *Pygostolus impennis* Karsch, by monotypy.
[Homonym of *Pygostolus* Haliday, 1833 : 263].

Pterotiltus Karsch, 1893 : 108. [Replacement name for *Pygostolus* Karsch.]

DIAGNOSIS. Head conical; fastigium, from above, pentagonal, about as wide as long, median longitudinal carinula weakly present or absent; frontal ridge sulcate, evanescent below median ocellus; lateral facial keels complete. Eyes bulbous. Antenna longer than combined lengths of head and pronotum. Prosternal process simple, conical with acute apex. Dorsum of pronotum cylindrical, deeply crossed by three transverse sulci, median carina very weak, lateral carinae absent; mesosternal interspace as wide as or longer than wide. Tegmina and hind wings extremely reduced, represented by small folds of integument on meso- and metathorax. Lower genicular lobe of hind femur spined; hind tibia not expanded apically and with rounded margins; external apical spine of hind tibia present. In male postero-dorsal margin of 10th abdominal tergite with a furcula or an unpaired structure resulting from fusion of the two lobes of furcula; epiphallus with divided bridge, without ancorae and with one or two pairs of lophi. Female ovipositor valves long, slender, smooth.

DISTRIBUTION. W. and C. Africa.

SPECIES INCLUDED

***Pterotiltus impennis* (Karsch)**

Pygostolus impennis Karsch, 1891 : 193, figs. Syntypes ♂ and ♀, CAMEROUN (MNHU, Berlin) [examined].

***P. inuncatus* (Karsch)**

Pygostolus inuncatus Karsch, 1892 : 72. Syntypes ♂ and ♀, CAMEROUN (MNHU, Berlin) [examined].

***P. miniatulus* Karsch**

Pterotiltus miniatulus Karsch, 1893 : 108. Syntypes ♂ and ♀, Togo (MNHU, Berlin) [examined].

***P. finoti* Dominique**

Pterotiltus finoti Dominique, 1900 : 207, pl. 3, figs 11-13. Holotype ♂, CONGO (BRAZZAVILLE) (? Nantes Museum).

***P. apicalis* I. Bolívar**

Pterotiltus apicalis I. Bolívar, 1905 : 226. Holotype ♀, FERNANDO PO (IEE, Madrid) [examined].

***P. coeruleocephalus* I. Bolívar**

Pterotiltus coeruleocephalus I. Bolívar, 1905 : 227. Holotype ♂, CAMEROUN (IEE, Madrid) [examined].

***P. femoratus* Ramme**

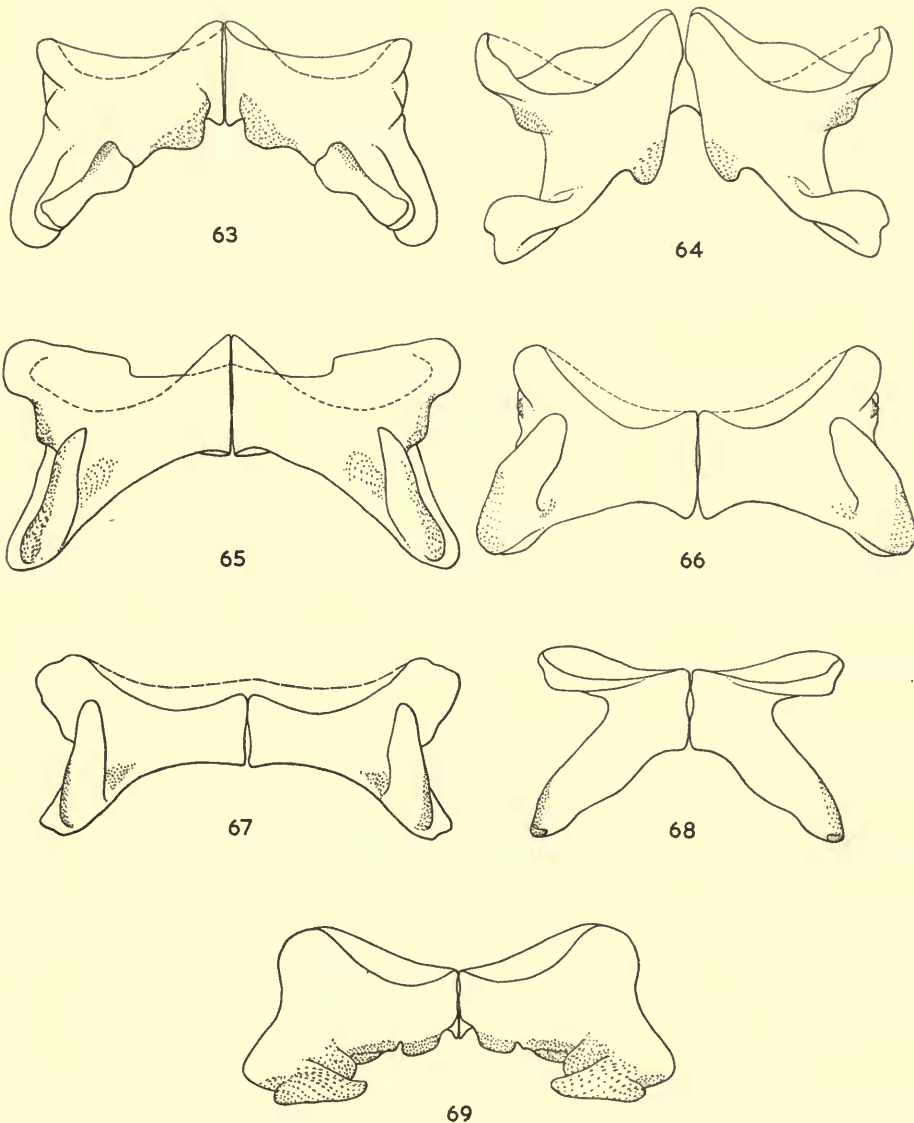
Pterotiltus femoratus Ramme, 1929 : 314, figs 34d, 35c. Holotype ♂, CAMEROUN (BMNH) [examined].

***P. berlandti* Ramme**

Pterotiltus berlandti Ramme, 1929 : 316. Holotype ♂, ZAIRE (? MNHN, Paris or MRAC, Tervuren).

***P. giorgii* Ramme**

Pterotiltus giorgii Ramme, 1929 : 317. Holotype ♀, ZAIRE (MRAC, Tervuren).



FIGS 63-69. *Pterotiltus* species, male epiphalli. 63, *P. apicalis* I. Bolívar; 64, *P. impennis* (Karsch); 65, *P. miniatulus* Karsch; 66 *P. occipitalis* Ramme; 67, *P. inuncatus* (Karsch); 68, *P. minimus* Ramme; 69, *Pterotiltus* sp., Uganda.

***P. occipitalis* Ramme**

Pterotiltus occipitalis Ramme, 1929 : 317. Holotype ♀, CAMEROUN (MNHU, Berlin) [examined].

***P. minimus* Ramme**

Pterotiltus minimus Ramme, 1929 : 318, fig. 36. Holotype ♂, CAMEROUN (MNHU, Berlin) [examined].

DISCUSSION. Species of this genus are forest-living and seem to represent the culmination of adaptation to forest life in the Oxyinae. The wings are completely reduced, many of the species have adopted aposematic coloration, the hind tibiae are cylindrical and have lost all trace of flattening or expansion, and the ovipositor valves have become smooth and obviously adapted to specialised oviposition sites.

Because of this high degree of specialisation the affinities of *Pterotiltus* are obscure, but the epiphallus resembles that of *Cylindrotiltus* and *Cercina* most closely.

***Oxyina* gen. n.**

(Text-figs 45-47)

Type-species: *Oxya bidentata* Willemse, 1925.

DIAGNOSIS. In external appearance very similar to *Oxya*. Differs in that male epiphallus is broad, plate-like, bears strongly developed ancorae and the ectophallic membrane is thickened anteriorly between the halves of the bridge.

DISTRIBUTION. Afghanistan, Iran, Pakistan, E. China, Java.

SPECIES INCLUDED

***Oxyina bidentata* (Willemse) comb. n.**

Oxya bidentata Willemse, 1925b : 24, figs 16, 17. Holotype ♂, PAKISTAN (BMNH) [examined].

***O. javana* (Willemse) comb. n.**

Oxya javana Willemse, 1956 : 148, fig. 87, pl. 1. Holotype ♀, JAVA (RNH, Leiden) [examined].

***O. sinobidentata* (Hollis) comb. n.**

Oxya sinobidentata Hollis, 1971 : 330, figs 228-233, 245. Holotype ♂, CHINA (BMNH) [examined].

DISCUSSION. Superficially this genus closely resembles *Oxya* but the male epiphallus is so distinct it is doubtful that the two genera have a common origin and their similarity is probably a result of convergence. In fact the epiphallus in *Oxyina* is distinct from all other Oxyinae and is similar to that of *Hieroglyphodes* (see Mason, 1973), a genus currently placed in the Hemiacridinae. However, *Oxyina* has more features common to the Oxyinae than to the Hemiacridinae and is placed in the former subfamily.

REFERENCES

- AKBAR, S. S. & BALOCK, H. A. 1970. A new species of *Gesonula* Uvarov, 1940 (Orthoptera: Acridoidea: Acrididae) from West Pakistan. *Pakistan J. Zool.* **2** : 11-15, 2 pls.
- AUDINET-SERVILLE, J. G. 1831. Revue méthodique des insectes de l'ordre des Orthoptères. *Annls Sci. nat.* **22** : 262-292.
- 1839. *Histoire naturelle des insectes. Orthoptères.* 776 pp., 14 pls. Paris.
- BOLÍVAR, I. 1898. Contributions à l'étude des Acridiens. Espèces de la faune Indo et Austro-Malaisienne du Museo Civico di Storia Naturale di Genova. *Annali Mus. civ. Stor. nat. Giacomo Doria* **19**(39) : 1-36.
- 1905. Ortópteros Acridioideos de la Guinea Española. *Mems R. Soc. esp. Hist. nat.* **1** : 209-240.
- 1908. Acridiens d'Afrique du Musée royal d'Histoire naturelle de Belgique. *Mém. Soc. ent. Belg.* **16** : 83-126.
- 1911. Orthoptères nouveaux du Congo Belge des collections du Musée de Tervuren. *Annls Soc. ent. Belg.* **55** : 298-306.
- 1918. Estudios entomológicos. Tercera parte. Sección Oxyae. (Orth. Acrididae o Locustidae). *Trab. Mus. nac. Cienc. nat., Madr. Zool.* **34** : 1-43.
- BRANCSIK, C. 1897. Series Orthopterorum novorum. *Jh. naturw. Ver. Trencsiner Kom.* **19-20** : 52-85.
- BRUNNER VON WATTENWYL, G. 1893. Révision du Système des Orthoptères et description des espèces rapportées par M. Leonardo Fea de Birmanie. *Annali Mus. civ. Stor. nat. Giacomo Doria* (2) **13** : 1-230, 6 pls.
- 1898. Orthopteren des Malayischen Archipels, gesammelt von Prof. Dr. W. Kükenthal in dem Jahren 1893 und 1894. *Abh. senckenb. naturforsch. Ges.* **24** : 193-288.
- CARL, J. 1916. Acridides nouveaux ou peu connus du Muséum de Genève. *Revue suisse Zool.* **24** : 461-518, 2 pls.
- CHANG, K. S. F. 1934. Notes on some *Oxya* species from Chekiang Province with the description of a new subspecies. *China J.* **21** : 185-192, 3 figs.
- 1939. Some new species of Chinese Acrididae (Orthoptera: Acrididae). *Notes Ent. chin.* **6** : 1-54, 3 pls.
- CHOPARD, L. 1958. La reserve naturelle intégrale du Mont Nimba. III. Acridiens (Mission L. Lamotte, février-juin, 1942). *Mém. Inst. fr. Afr. noire* **53** : 127-153, 7 figs.
- DESCAMPS, M. & DONSKOFF, M. 1968. Contribution à la faune du Congo (Brazzaville). Mission A. Villers et A. Descarpentries. 77. Orthoptères Pyrgomorphidae et Acrididae. *Bull. Inst. fond. Afr. noire.* **30** : 1198-1235, 42 figs.
- DIRSH, V. M. 1952. Studies on new and little known African Acrididae (Orthoptera). *Revue Zool. Bot. afr.* **46** : 258-268, 24 figs.
- 1956. The phallic complex in Acridoidea (Orthoptera) in relation to taxonomy. *Trans. R. ent. Soc. Lond.* **108** : 223-356, 66 pls.
- 1961. A preliminary revision of the families and subfamilies of Acridoidea (Orthoptera). *Bull. Br. Mus. nat. Hist. (Ent.)* **10** : 351-419.
- 1962. The Acridoidea (Orthoptera) of Madagascar. I. Acrididae (except Acridinae). *Bull. Br. Mus. nat. Hist. (Ent.)* **12** : 273-350, 40 figs.
- 1965. *The African genera of Acridoidea.* 579 pp., 452 figs. Cambridge.
- DOMINIQUE, J. 1900. Trois Orthoptères nouveaux du Congo français. *Bull. Soc. Sci. nat. Oest Fr.* **10** : 203-210, 1 pl.
- FABRICIUS, J. C. 1787. *Mantissa Insectorum.* **1.** 348 pp. Hafniae.
- GIGLIO-TOS, E. 1907. Ortotteri Africani. Parte I. *Boll. Musei Zool. Anat. comp. R. Univ. Torino* **22** : 1-35.
- HALIDAY, A. H. 1833. An essay on the classification of the parasitic Hymenoptera of Britain, which correspond with the Ichneumonones minuti of Linnaeus. *Ent. Mag.* **1** : 263.
- HENRY, G. M. 1933. Descriptions and records of Ceylonese Acrididae. *Spolia Zeylan.* **17** : 155-200, 3 figs, 9 pls.

- HOLLIS, D. 1971. A preliminary revision of the genus *Oxya* Audinet-Serville (Orthoptera: Acridoidea). *Bull. Br. Mus. nat. Hist. (Ent.)*. **26** : 269-343, 269 figs.
- JAGO, N. D. 1962. New species and new records of Acrididae (Orthoptera) from West Africa. *Proc. R. ent. Soc. Lond. (B)* **31** : 137-150, 37 figs.
- 1966. A new species of the genus *Badistica* Karsch, 1891 from West Africa. (Orth. Acridoidea) *Eos, Madr.* **41** : 331-341, 2 figs.
- KARNY, H. 1907. Ergebnisse der mit Subvention aus der Erbschaft Treitl unternommen zoologischen Forschungsreise Dr. Franz Werner's nach dem ägyptischen Sudan und Nord-Uganda. IX. Die Orthopterenfauna des ägyptischen Sudans und von Nord-Uganda (Saltatoria, Gressoria, Dermaptera) mit besonderer Berücksichtigung der Acridoideengattung *Catantops*. *Sber. Akad. Wiss. Wien.* **116** : 267-373, 3 pls.
- KARSCH, F. 1891. Verzeichniss der von Herrn Dr. Paul Preuss in Kamerun erbeuteten Acridioideen. *Berl. ent. Z.* **36** : 175-196, figs.
- 1892. Verzeichniss der von Herrn Dr. Paul Preuss in Kamerungebirge erbeuteten Orthopteren. *Berl. ent. Z.* **37** : 65-78, 3 figs.
- 1893. Die Insecten der Berglandschaft Adeli im Hinterlande von Togo (Westafrika). *Berl. ent. Z.* **38** : 1-266, 6 pls, 35 figs.
- 1896. Neue Orthopteren aus dem tropischen Afrika. *Stettin. ent. Ztg* **57** : 242-259, 44 figs.
- KIRBY, W. F. 1910. *A synonymic catalogue of Orthoptera*. III. Orthoptera Saltatoria II. Locustidae vel Acridiidae. 674 pp. London.
- 1914. *The fauna of British India including Ceylon and Burma*. Orthoptera (Acridiidae). 276 pp., 138 figs. London.
- KRAUSS, H. A. 1903. Orthopteren aus Australien und dem Malayischen Archipel, gesammelt von Professor Dr. Richard Semon. 5. Zoologische Forschungsreisen in Australien und dem Malayischen Archipel. *Denkschr. med-naturw. Ges. Jena* **8** : 745-770, pl. 67.
- MARSCHALL, A. F. VON. 1836. Decas Orthopterorum novorum. *Annln wien. Mus. Naturg.* **1** : 209-217, 1 pl.
- MASON, J. B. 1973. A revision of the genera *Hieroglyphus* Krauss, *Parahieroglyphus* Carl and *Hieroglyphodes* Uvarov (Orthoptera: Acridoidea). *Bull. Br. Mus. nat. Hist. (Ent.)*. **28** : 507-560, 142 figs, 4 maps.
- MATSUMURA, S. 1910. *Die schädlichen und nützlichen Insecten von zuherrohr Formosas*. 52 pp., 30 pl. Tokyo.
- MILLER, N. C. E. 1934. 14. Notes on Malayan Acrididae and descriptions of some new genera and species. *J. fed. Malay St. Mus.* **17** : 526-548, 1 pl., 9 figs.
- 1935. 44. New and little known Malayan Acrididae. *J. fed. Malay St. Mus.* **17** : 686-709, 1 pl., 11 figs.
- 1953. A new species of *Lucretilis* (Orthoptera-Acrididae) from Malaya. *Proc. R. ent. soc. Lond. (B)* **22** : 142-143, 1 fig.
- NEVILL, G. 1878. *Handlist of the Mollusca in the Indian Museum*. **1** : 16. Calcutta.
- RAMME, W. 1929. Afrikanische Acrididae. Revisionen und Beschreibungen wenig bekannter und neuer Gattungen und Arten. *Mitt. zool. Mus. Berl.* **15** : 247-493, 14 pls, 106 figs.
- 1931. Ergänzungen und Berichtigungen zu meiner Arbeit "Afrikanische Acrididae" (Orth.) *Mitt. zool. Mus. Berl.* **16** : 918-946, pl. 11.
- 1941. Beiträge zur Kenntnis der Acrididen-Fauna des indomalayischen und benachbarter Gebiete (Orth.) *Mitt. zool. Mus. Berl.* **25** : 1-219, 55 figs, 21 pls.
- REHN, J. A. G. 1952. On the genus *Gesomula* (Orthoptera: Acrididae: Cyrtacanthacridinae). *Trans. Am. ent. Soc.* **78** : 117-136, pls 5, 6.
- 1957. *The grasshoppers and locusts (Acridoidea) of Australia*. III. Family Acrididae: Superfamily Cyrtacanthacridinae. Tribes Oxyini, Spathosternini and Praxibulini. 273 pp., 29 pls. Melbourne.
- SHIRAKI, T. 1910. *Acrididen Japans*. 90 pp., 1 pl. Tokyo.
- SJÖSTEDT, Y. 1920. Results of Dr. E. Mjöberg's Swedish scientific expeditions to Australia 1910-1913. 20. Acridoidea. *Ark. Zool.* **12** : 1-67, 2 pls.

- 1935. Revision der Australischen Acridiodeen. 2. Monographie. *K. svenska VetenskAkad Handl.* (3) **15** : 3-191, 2 pls.
- STÅL, C. 1861. In Virgin, C. A. *Kongliga Svenska Fregatten Eugenies Resa omkring jorden under befäl af C. A. Virgin.* II. Zoologi, I. Insecta: Orthoptera. Species novas descriptis, pp. 299-350. Stockholm (& Uppsala).
- 1873. *Recensio Orthopterorum. Revue critique des Orthoptères décrits par Linné, de Geer et Thunberg*, 1, 154 pp. Stockholm.
- 1875. Observations Orthoptérologiques. *K. Svenska VetenskAkad. Handl.* **3** : 3-43.
- 1878. Systema Acridiodeorum. Essai d'une systematisation des Acridiodees 1. *Bih. K. Svenska VetenskAkad. Handl.* **5** : 100 pp.
- THUNBERG, C. P. 1815. Hemipterorum maxillosorum genera illustrata plurimisque novis speciebus dilata ac descripta. *Mém. Acad. Sci. St. Pétersb.* **5** : 211-301, 1 pl.
- 1824. Grylli monographia, illustrata. *Mém. Acad. Sci. St. Pétersb.* **9** : 390-430.
- TINKHAM, E. R. 1935. Distributional and ecological notes on the Acrididae from southeastern Kwangsi, with a key to the genus *Hieroglyphus*. *Lingnan Sci. J.* **14** : 477-498.
- 1940. Taxonomic and biological studies on the Cyrtacanthacrinae of South China. *Lingnan Sci. J.* **19** : 271-382, 16 pls.
- TSAI, PANG-HWA. 1931. Zwei neue *Oxya*-arten aus China (Orth. Acrid). *Mitt. zool. Mus. Berl.* **17** : 436-440, 2 figs.
- UVAROV, B. P. 1921. Records and descriptions of Indian Acrididae (Orthoptera). *Annls Mag. nat. Hist.* (9) **7** : 480-509.
- 1925. A new grasshopper injurious to rice in Siam. *Bull. ent. Res.* **16** : 159-161, 5 figs.
- 1927. Some Orthoptera of the families Mantidae, Tettigoniidae and Acrididae from Ceylon. *Spolia Zeylan.* **14** : 85-114, 1 pl.
- 1929. Acrididen (Orthoptera) aus Süd-Indien. *Revue suisse Zool.* **36** : 533-563, 4 figs.
- 1937. Some Acrididae from the Solomon Islands. (Orthoptera). *Treubia* **16** : 15-20.
- 1940. Twenty-eight new generic names in Orthoptera. *Ann. Mag. nat. Hist.* (11) **5** : 173-176.
- 1953. Grasshoppers (Orthoptera: Acrididae) of Angola and Northern Rhodesia, collected by Mr. Malcolm Burr in 1927-1928. *Publicoes cult. Co. Diam. Angola* **21** : 1-217, 295 figs.
- 1966. *Grasshoppers and locusts*. A handbook of general Acridology. **1**. 481 pp. Cambridge.
- WALKER, F. 1858. *List of the specimens of lepidopterous insects in the collection of the British Museum.* **16** : 75. London.
- 1870. *Catalogue of the specimens of Dermaptera, Saltatoria in the collection of the British Museum.* IV. Pp. 605-809. London.
- 1871. *Supplement to the catalogue of Dermaptera Saltatoria.* 114 pp. London.
- WILLEMSE, C. 1921. Bijdrage tot de kennis der Orthoptera ss. van den Nederlandsch Indischen Archipel en omliggende gebieden. *Zoöl. Meded., Leiden* **6** : 1-44, 4 figs. 1 pl.
- 1924. Zwei neue *Caryanda*-Arten (Orthopt. Subfam. Acridoidea, trib. Cyrtacanthacrinae). *Tijdschr. Ent.* **67** : 156-159, 1 fig.
- 1925a. Description d'un nouveau genre d'Orthoptera (Fam. Acridoidea, sous-famille Cyrtacanthacridinae). *Treubia* **6** : 355-359, 1 fig.
- 1925b. Revision der Gattung *Oxya* Serville (Orthoptera, Subfam. Acridoidea, trib. Cyrtacanthacrinae). *Tijdschr. Ent.* **68** : 1-70, 65 figs.
- 1928. Spolia Mentawiensia: Acridiidae (Orthoptera). *J. Malay brch. R. Asiat. Soc.* **6** : 1-12, 3 pls.
- 1930. Fauna Sumatrensis. (Bijdrage Nr. 62). Preliminary revision of the Acrididae (Orthoptera). *Tijdschr. Ent.* **73** : 1-210, 101 figs.
- 1931a. Orthoptera Celebica Sarasiniana. I. Saltatoria, Fam. Acrididae. *Treubia* **12** (Suppl.) : 189-270, 112 figs.
- 1931b. Beschreibung von einigen neuen Acridoidea von den Salomon-Inseln. (Subfam. Catantopinae, Orthoptera.) *Int. ent. Z.* **33** : 333-337 3 5-350, 4 figs.

- WILLEMSE, C. 1932. Descriptions of some new Acrididae chiefly from the Indo-Malayan region (Orthoptera). *Annls Soc. ent. Fr.* **101** : 141-156.
- 1933. Description of new Indo-Malayan Acrididae (Orthoptera). *Natuurh. Maandbl.* **22** : 1-11, 1 pl., 3 figs.
- 1935a. Remarks on some Indo-Malayan Acrididae, with description of new species. I. *Ent. Ber., Amst.* **9** : 179-185, 3 figs.
- 1935b. Some new Acridoidea from the Solomon Islands. *Stylops* **4** : 165-168, 2 figs.
- 1936. Remarks on some Indo-Malayan Acridinae, with descriptions of new species. II. *Ent. Ber., Amst.* **9** : 197-204, 3 figs.
- 1938. Description of new Indo-Malayan Acrididae (Orthoptera). Parts VIII-IX. *Natuurh. Maandbl.* **27** : 83-84, 8 figs, 116-120, figs 1-5.
- 1939. Description of New Indo-Malayan Acrididae. Part X. *Natuurh. Maandbl.* **28** : 72-75, 89-91, 4 figs.
- 1956. Synopsis of the Acridoidea of the Indo-Malayan and adjacent regions. (Insecta, Orthoptera). Part II. Fam. Acrididae, Subfam. Catantopinae, part one. *Publië's natuurh. Genoot. Limburg* **8** : 3-225, 72 figs.
- 1957. Synopsis of the Acridoidea of the Indo-Malayan and adjacent regions. Part II. Fam. Acrididae, subfam. Catantopinae. *Publië's natuurh. Genoot. Limburg* **10** : 227-500, pls 1-15.
- 1962. Descriptions of new and redescriptions of ill known Orthoptera Part I. *Natuurh. Maandbl.* **51** : 48-55, 10 figs.

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Junior synonyms are in *italics*.

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